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DISEASES OF INFANTS AND CHILDREN

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ORIGINAL COMMUNICATIONS.

A REPORT UPON ONE THOUSAND TUBERCULIN TESTS IN YOUNG CHILDREN.*

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The observations included in the following report were all made at the Babies' Hospital upon ward patients. Very few of the children were over three years of age, the majority being under two years. Nearly all of the observations have been made in the past year. I desire at the outset to express my indebtedness to Dr. Josephine Hemenway, house physician at the Babies' Hospital, for her invaluable assistance in the work, the results of which are embodied in this paper. In the early part of the year, unless some positive contraindication existed, some test, most frequently the eye test, was used as a routine measure, in order to determine whether and under what circumstances reactions were obtained in healthy children or in those at least presumably non-tubercular. During the latter half of the period the tests have been chiefly used when some grounds for suspecting tuberculosis existed. Routine tests proved of considerable value in revealing cases of tuberculosis not hitherto suspected. A positive reaction to a skin or eye test was immediately followed up by careful clinical study of the case to discover, if possible, any other evidence of tuberculosis. In a large proportion of such patients bacilli were found in the sputum; though in many only after prolonged search and repeated examinations, thus establishing the accuracy and the value of the test. In many patients further evidence was afforded by the development of definite signs of pulmonary disease.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 26, 1908.

The Ophthalmic Reaction.—The ophthalmic test was made 615 times; in most instances one test only was made in a patient, although in a few children, where the results were questionable, the test was repeated. The ophthalmic tests were all made with tuberculin obtained from the Rockefeller Institute, which had been precipitated with 65 per cent. alcohol. Before using it was freshly dissolved in a sterile saline solution. For the first half of these tests a 1 per cent. solution was used, for the latter half a ½ per cent. Especial care was taken not to use the tuberculin in an eye which was the seat of any form of disease, tuberculous or otherwise. As a further precaution the hands of the children were confined during the first twelve hours to prevent any rubbing of the eye.

RESULTS IN 615 OPHTHALMIC TESTS.

Pathological Condition.		Positive Reactions.	Negative Reactions.	Doubtful Reactions.
Positive tuberculosis ..... (Autopsy or bacilli in sputum.)	38	25	10 (9 dying or extremely sick children.)	3
Probable tuberculosis .... (Evidence: Other tuberculin reactions, history or physical signs)	21	19	..	2
Probably *not* tuberculosis..	555	2	546	7 (All slight.)
Positively not tuberculosis.. (Autopsy.)	1	1	..	..
Totals.......	615	47	556	12

In the preceding table are given the reactions in the different types of cases. In the group marked *probably not tuberculosis* are included those in which no evidence of tuberculosis existed other than the reaction.

The clinical course which the reaction follows is its most diagnostic feature and hence rather close observation of a patient is necessary or some of the milder reactions will be missed. There is usually congestion of the conjunctiva, with some swelling and an increased secretion of mucus, which is frequently very abundant, so that the lids are adherent. There are very seldom pus cells and repeated cultures made revealed no micro-organisms. The symptoms usually begin in from six to eight hours after the tuberculin is used and reach their height in the first twenty-four hours, gradually fading. The usual duration of symptoms is from one to three days. In about 12 per cent. of the cases the reaction lasted somewhat longer than three days; in one case it lasted ten days, but in no case was the test followed by any unpleasant results. Having the opposite eye for comparison enables one, in most cases, to be certain as to the existence of a reaction. There were, however, a few cases in which the symptoms were so slight that the results must be classed as doubtful.

I am aware that serious results with the ophthalmic test have occasionally been reported by other observers. The precautionary measures taken in this group of cases are, I believe, of considerable importance and largely responsible for our freedom from unpleasant results. On account of the kind of observation necessary, and the possible dangers connected with the eye test, it is not wise to employ it indiscriminately as among the outpatients of a hospital.

The statement has been repeatedly made that young infants do not respond to the eye test. Such was not our experience. Of this series of cases positive reactions were obtained in 14 patients under one year old, 6 of whom were under six months and 1 only two months old. So far as we could see, the character of the reaction and the frequency with which it occurred were not affected by the age of the patients nor by the extent nor activity of the pathological process, but only by the susceptibility of the patient. In no cases were positive reactions obtained in dying children or those suffering from extreme prostration. In this respect it corresponded with the other tests.

The Skin Reaction.—The skin test of Von Pirquet was employed 217 times. It was made with crude tuberculin obtained from the laboratory of the New York Health Department, which was simply diluted with sterile water to a 25 per cent. strength. With a sterile needle three short linear scratches were made, usually upon the extensor surface of the forearm and into the middle one the tuberculin was rubbed. The skin was allowed to dry and in some cases was covered for a few hours with a piece of sterile gauze. The first sign of reaction was usually apparent in from six to twelve hours; rarely later than twenty-four hours. There is seen a rather bright aureola slowly spreading from the line of scarification to a distance, varying with the intensity of the reaction, from $^1/_{16}$ to $^1/_4$ inch. The more pronounced reactions are accompanied by an induration readily palpable. The reaction reaches its height in most cases in from twenty-four to thirty-six hours. It then fades rather slowly, usually lasting two or three days, but not infrequently for a week or even longer. It may be followed by a slight desquamation. Vesiculation was not observed. Although it varied considerably in intensity the reaction was generally perfectly definite and in no instance was the result considered doubtful.

In the following table is given a summary of the reactions obtained in the different pathological conditions. As in the table of ophthalmic reactions, *probably not tuberculosis* signifies no other evidence of tuberculosis than the reaction to the test:—

RESULTS IN 217 SKIN TESTS (VON PIRQUET).

Pathological Condition.		Positive Reactions.	Negative Reactions.
Positive tuberculosis ..... (Sputum, autopsy or operation.)	22	12	10 (9 dying or extremely sick children; 1 cured.
Probable tuberculosis ..... (Evidence: Other tests, history or physical signs.)	20	15	5
Probably not tuberculosis..	172	6	166
Positively not tuberculosis.. (Autopsy.)	3	..	3
Totals.......	217	33	184

The reaction in general corresponded with the pathological condition, the exceptions being in the second and third groups of cases in which we had no means of determining definitely as to the reliability of the reaction.

The skin test possesses the great advantage of ease of application, of not requiring close observation, and of freedom from unpleasant or serious consequences. In no instance was any trouble seen from the inoculation or any excessive reaction. With the two scarifications for control there seemed little difficulty in recognizing a positive reaction; whereas, in the eye there were a certain number of cases in which doubt existed as to whether or not enough disturbance was seen to be called a reaction.

The Puncture Reaction.—When tuberculin is injected to secure the fever reaction in doses ranging from $^1/_{10}$ mgr. to 5 mgr., no local reaction is observed if the injections are made deeply into the muscles. If, however, they are made subcutaneously a local reaction is regularly seen in cases in which a positive fever reaction occurs. This phenomenon, first observed by Epstein, afterward by Schick, is known as the "stich-reaction." In 38 cases tuberculin was injected subcutaneously for the purpose of obtaining this puncture reaction. The usual dose employed for this purpose was $^1/_{100}$ mgr. These patients were all submitted previously or subsequently to Von Pirquet's skin test. The skin reaction corresponded in every instance with the puncture reaction, hence it seems unnecessary to tabulate the cases separately. With the dose mentioned, the puncture reaction was not so marked as when a larger dose (½ mgr. or 1 mgr.) was used. The conclusion drawn from this limited experience was that the puncture test possessed no advantages over the scarification test and that it was somewhat more troublesome of application.

Fever Reaction to Tuberculin Injections.—This is quite as reliable in young children as in older patients. The fever test is limited in its application since most cases of active tuberculosis at this period of life are accompanied by fever. Furthermore, young children have slight rises of temperature from so many causes that unless the reaction is decided and typical in its course the result may be doubtful. I have not considered a reaction definite unless the temperature has reached at least 102°F. It is necessary that the temperature be taken at four-hour intervals before the injection is given and after the injection at two-hour intervals. Accurate dosage is a matter of much importance. Very small doses are unreliable and too large doses may be fraught with some risk. After considerable experimenting I have settled upon the doses of ½ mgr. for infants under six months and 1 mgr. for those who are older.

Injections of tuberculin in patients suspected to be tuberculous were employed 130 times. For the most part, the injections were made deeply into the muscles and no local reactions were observed. The temperature usually began to rise in from six to twelve hours, reaching its maximum in from four to eight hours. The average maximum reaction was 103.3°, which was reached on the average in thirteen hours. The temperature remained near the highest point for from six to eight hours and then rather rapidly fell to the normal. As a rule, the larger the dose given the more rapid the reaction and the higher the temperature. In no case were any serious symptoms observed to follow the injection, although in several instances high temperatures were accompanied by discomfort, restlessness and other symptoms indicating a constitutional disturbance of some severity. In no instance was it apparent that the injection had resulted in the lighting up of a latent tuberculous process. In a few instances a general erythema was noticed as after diphtheria antitoxin.

The results of the injections in the various pathological conditions are shown in the following table:—

RESULTS OF 130 TUBERCULIN INJECTIONS.

Pathological Condition.		Positive Reactions.	Negative Reactions.	Doubtful Reactions.
Positive tuberculosis ..... (Sputum, autopsy, operation or c. s. fluid.)	28	22	2 (In 1 patient apparently cured.)	4
Probable tuberculosis .... (Evidence: Other tests, history or physical signs.)	21	18	3	..
Probably *not* tuberculosis..	80	1	78	1
Positively *not* tuberculosis.. (Autopsy.)	1	1	..	..
Totals.......	130	42	83	5

On the whole the results obtained by the different tests corresponded with each other and with the pathological condition as determined by other means, the only notable exception being that dying children or those who were extremely sick did not, as a rule, react to any of the tests. An attempt has been made to compare the reliability of the different tests by grouping the exceptional reactions observed in 16 cases in the following table. The numbers, however, are too small to admit of any very definite conclusions.

It will be seen that some failures and some unexplained reactions occurred with all of the tests. The results with any test cannot therefore be regarded as conclusive, although a positive reaction creates a very strong probability that tuberculosis is present. This is increased if the result is confirmed by other tests.

In reliability there is not much to choose between the skin and eye tests. The skin reaction is, I think, more characteristic and less likely to be doubtful than are some of the eye reactions. Some instances of doubt must occur in the temperature reactions on account of the liability of small children to slight rises of temperature from minor digestive disturbances or other causes.

In ease of application there is a decided advantage in the skin test. The scarification is a trifling thing. The patient does not require continuous observation before or after, and the reaction lasts for a considerable time. The ophthalmic cases need closer watching, the reaction is shorter and may be missed. It cannot well be used in ambulatory patients. The puncture test is slightly more of an operation and may be objected to. The fever reaction is only admissible when the child can be under very close observation.

Objectionable features are wanting in the skin test. There is no local discomfort, no general reaction, and I have seen no complications. With proper precautions I believe the eye test to be quite safe, although an intense or prolonged reaction sometimes occurs which is not pleasant to see; besides, in pathological conditions of the eye disastrous results may follow. However the eye is too delicate and important an organ to be used for a test when any other will answer quite as well. For general use the skin test is to be advised in preference.

With the temperature reaction we may get accompanying the fever constitutional symptoms which are quite disagreeable. There exists a possibility that a latent process may be lighted up. With mistakes in dosage which have been made, serious consequences may follow. These risks are added objections to the use of this test. It is certainly an advantage to have several tests both

EXCEPTIONAL REACTIONS IN 16 CASES.

(— =negative reaction; + =positive; ?=doubtful.)

I. POSITIVE TUBERCULOSIS WITH NEGATIVE OR CONTRADICTORY REACTIONS.

Case	Age	History and Clinical Diagnosis	Eye	Skin	Puncture	Fever	Remarks
1	20 mos	Bronchopneumonia; bacilli in sputum.	— to 1% — to 1%	—			First eye test in January; skin and second eye test in May, shortly before death.
2	6 mos.	Chronic costosternal abscess; bacilli in discharge.				— to 1/10 mgr. (twice) — to 1 mgr. + to 1 " (102° in 13 hrs.) ? 3 mgr. (103° in 24 hrs.)	Had croup at time last test was made. Died of diphtheria 5 months later. Abscess never healed.
3	4 years	Tuberculous glands; operation	— to ½%	+			Skin test 1 month later than eye

II. PROBABLE TUBERCULOSIS WITH NEGATIVE OR CONTRADICTORY REACTIONS

Case	Age	History and Clinical Diagnosis	Eye	Skin	Puncture	Fever	Remarks
4	3 years	Bronchopneumonia; empyema; recovery; father tuberculous.	— to ½% — to 1%	+	+		Apparently well 5 months after attack.
5	3 years	Unresolved bronchopneumonia.	+ to 1%	+	+	— to 1 mgr.	Three months later child apparently well.
6	14 mos.	Bronchitis; large abdomen; tubercular peritonitis. (?)			+	— to 1/10 mgr. + to 1 mgr. (104.4° in 13 hrs.)	Following second injection a local reaction occurred at site of first one made 10 days before. Lost sight of.
7	4 years	Chronic Bronchitis; signs cleared up.	+ to ½% Feb.	+ Feb (twice) — July	+ June	+ Feb. (three times) + June	Following tuberculin injection in June, typical reaction in eye in which tuberculin was used 4 months before.
8	4 years	Anemia, malnutrition; no pulmonary signs. (Sister died of tubercular meningitis.)		+		— to 1 mgr.	Lost sight of.

for purposes of confirmation and to use one where another is not applicable. For all tests one must be sure as to the purity, strength and freshness of the tuberculin used.

All of these tests have been too recently introduced for the final word to be spoken regarding them. No one of them is absolutely conclusive as is the demonstration of the tubercle bacillus in the sputum, cerebro-spinal fluid or elsewhere, and one should not fall into the error of depending upon the local tests to the neglect of other means of diagnosis, even though the search for the tubercle bacillus involves greater labor. In general, while the tests furnish strong probability of the existence of a tuberculous

III. PROBABLY NOT, OR WITH NO OTHER EVIDENCE OF, TUBERCULOSIS, BUT WITH POSITIVE OR CONTRADICTORY REACTIONS.

Case	Age	History and Clinical Diagnosis	Eye	Skin	Puncture	Fever	Remarks
9	10 mos	Pyemic abscesses.	+ to ½% – to 1%	–			Fat, well nourished child
10	9 mos.	Bronchitis; recovery; well nourished child.	+ to ½% (April)	– April – July		+ ½ mgr. (102.4° in 14 hrs.)	Child well 3 months after test.
11	9 mos.	Unresolved bronchopneumonia.	– to ½%	– (twice)		+ ½ mgr. (104° in 8 hrs.)	Lost sight of.
12	22 mos	Bronchopneumonia: sequel of measles; general condition bad; sputum neg.	+ to ½%	–	– (twice)		Died. No autopsy.
13	3 years	Chronic bronchitis; no family history.		+	+	– to 1 mgr.	Poorly nourished child, but running about. Reported well 5 mos. later.
14		Malnutrition and gastroenteritis; family history negative.		+ (twice)		– to 1 mgr.	No pulmonary signs 2 weeks later. Lost sight of.

IV. POSITIVELY NOT TUBERCULOSIS, WITH POSITIVE OR CONTRADICTORY REACTIONS.

Case	Age	History and Clinical Diagnosis	Eye	Skin	Puncture	Fever	Remarks
15	7 mos.	Bronchopneumonia; autopsy.	+ to ½%				Many sputum examinations all negative. In good condition at time of test.
16	17 mos.	Bronchopneumonia; autopsy.				– to 1/10 mgr. – to 1 mgr. + to 5 mgr. (102° in 21 hrs.)	Condition good at first two tests; bad at last test.

lesion, they do not enable us to distinguish between a latent and an active condition. This may at times be confusing. A child may give a positive skin or eye reaction when suffering from an acute pulmonary disease which by its course is shown to be non-tuberculous, although grave suspicion of acute pulmonary tuberculosis may have existed and apparently be confirmed by the tuberculin tests. Much needless alarm may therefore be produced by a positive reaction, which really indicates only that somewhere the child has a tuberculous focus but does not prove that his present disease is of a tuberculous nature. While of the greatest assistance in diagnosis, the various tests are always to be taken in connection with the general symptoms and the physical signs. Taken apart from them, however, they may be very misleading.

14 West 55th St., New York.

TICS AND THEIR TREATMENT.*

BY E. W. SCRIPTURE, PH.D. (LEIPZIG), M.D. (MUNICH).
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Symptoms.—Here is a patient who from time to time screws his mouth around to the left side. Let us note the characteristics of this movement. It is a movement of a group of voluntary muscles. It is such a movement as might be made for a definite purpose. The patient will tell you that he did not intend to make the movement and that he could not help it or could resist it only with difficulty. Such a movement is called a "tic."

This patient says he makes the movement whenever he thinks of it. Other patients do not know when they make the movements. This is an important difference, which we may indicate by assigning tics to two classes—conscious and unconscious.

The most usual tics are the following: Tics of the eyelids, the snorting tic, the sucking tic, the surprise tic of the forehead, the frowning tic, the grimacing tic, the scalp tic, various tics of the ear muscles (including one of the middle ear that produces a click), several tics of the chin, the licking tic of the tongue, the clicking tic, several masticating tics, the trismic tic, various tics of the neck including torticollis, tics of the shoulders and arms and hands, of the trunk, legs, etc., also coughing, spitting, swallowing, eruction and vomiting tics, tic of swallowing air, and many respiratory tics.

Pathology.—In some cases it is possible to trace the origin of the tic. The patient will remember that he once got a speck of dust in the eye and that, after the speck was removed, he continued to shut his eye tightly from time to time ever since.

In another case there was a snort involving the left side of the face. I found an obstructed nasal passage. The snort was not of a form that would help clear the nose, but it probably had its origin in this way. The nasal obstruction was removed, but the snort remained. It was therefore a tic.

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* Read by request before the Section on Pediatrics of the New York Academy of Medicine, November 12, 1908.

So many cases of this kind occur that it seems safe to say that a tic arises most often as an action performed for some definite purpose. When the occasion is past, the action ceases normally, but in certain individuals it persists involuntarily. These persisting actions are the tics.

Why the action persists I cannot say. The tics appear to be related to the obsessions so common in childhood where the person is compelled to touch every post he passes or to always step on every flagstone twice or to avoid the cracks in the sidewalks. The element of compulsion is present in both. I remember that as a child I had several obsessions. For example, in crossing a street I must always step on the further sidewalk with the same foot I stepped off with. If by any accident this did not happen I could not get rid of the thought and was forced to find an opportunity, even if days elapsed, to go back to that same crossing and "even-up" the number of steps.

The "ticker" is similarly obsessed. He can by an effort refrain from the movement, but, in most cases, he must seize a favorable opportunity when no one is looking and then perform an extra number of movements.

Etiology.—One group of the tickers comprises those of neurasthenic disposition. Some of the neurasthenic children become stutterers, some become tickers.

Among the various causes that produce tics in the neurasthenic there are peripheral irritations, such as objects falling into the eye, nasal obstructions, annoying collars and other articles of clothing, skin diseases, etc.

Chorea (St. Vitus' dance) furnishes a large number of tickers. This may be due to peripheral or central irritations.

Some children acquire tics by imitating others. The imitation may be begun in jest and then be found to be fixed, or the movement may be acquired gradually. Such children are presumably neurasthenic.

Other tics may arise from emotional disturbances. These are the tics that arise on a hysterical basis. Here is a case of a little girl who at the age of ten saw a schoolmate prepared for burial. Shortly thereafter twitchings of her arms were noticed. These twitchings gradually involved the whole trunk and head. At one time she had asthma. At present she shows extended twitchings of the head, arms and trunk and also a respiratory twitch. At the same time there is present an abnormal mental condition of emotional instability and wilfulness. She is undoubtedly a case of hysteria resulting from the emotional disturbance involved in seeing her dead schoolmate.

Differential Diagnosis.—From normal movements the tic is distinguished by the lack of an adequate cause. One child with a snorting movement was found to possess a large polyp in the nose; on removing the polyp the snorting ceased; the movement was therefore not a tic.

From spasmodic acts the tic is distinguished by its mental character. A spasm involves only the spinal reflex. A cramp of the facialis may be a spasm or a tic, according to the nature of the disease. A spasm is not modified by attention, distraction or emotion; it usually affects the muscles supplied by a single nerve; it is not preceded by a feeling of compulsion; it is not followed by a feeling of relief. If the convulsive movement persists during sleep it is a spasm; if not, it is a tic. I have had a severe case of torticollis which had been repeatedly operated upon; the movement ceased in hypnotic sleep.

From chorea (St. Vitus' dance) the tic is distinguished by the systematic nature of the movements, with the relatively longer pauses.

In paramyoclonus multiplex the cramps occur in single muscles; there are also other differences.

The term "stereotype movements" or "habit spasms" should be reserved for movements that do not differ in their form from normal movements; the convulsive character is lacking. One professor of my acquaintance had the habit of inserting "er" into his sentences whenever he spoke in public. It was purely a habit and not a tic. The regularly repeated spasmodic movements found in cases of hysteria are, in my opinion, genuine tics.

Therapy.—The tic on neurasthenic basis is often benefitted by tonic treatment. I have seen a case rapidly improved with Fowler's solution.

The tic on hysterical basis demands treatment aimed at the mental condition that caused it. The emotional complex is found by the psychanalysis of Drs. Freud and Jung, and is removed by the appropriate mental treatment. Cases of hysterical tremors, cramps, paralyses and tics can often be completely and permanently cured in this way.

Special methods of treatment have been proposed. The one I have found most effective is that of conscious repetition.

The patient is told to hold a mirror before himself and to watch for the tic. When he sees it he is to repeat it five times voluntarily. His first attempt at imitating his own act is often ludicrously inadequate. The failure of the imitation is specially marked when the tics are unconscious ones. You explain to him that he must try hard to imitate himself exactly and must keep up the effort until it is entirely under his control. The mirror is of great advantage, but it is not necessary. The patient is to voluntarily repeat the tic movement whenever he can catch it.

The effect of the treatment may be explained, I believe, as follows: The tic is carried out by mental activity of less than full consciousness; the entire act may have become completely subconscious. Perfect voluntary imitation of the act trains the mind to doing exactly the same act consciously. Thereafter the act is no longer an involuntary subconscious one, but a voluntary conscious act. The tic has been killed.

87 Madison Avenue.

KERNIG'S SIGN IN MENINGITIS.—(*Zeitschr. f. klin. Med.*, Vol. LXIV., Nos. 1 and 2).—Some twenty-four years ago, Kernig first called attention to his now well known sign in meningitis. Since that time he has tested thousands of cases of meningitis and of other diseases for the presence of this sign, with instructive results. In 208 cases of acute meningitis, 87 per cent. showed the sign; the same was true in 94 per cent. of his cases of epidemic cerebrospinal meningitis and in 91 per cent. of tuberculous meningitis. On the whole, the more severe the infection, the earlier the sign appears. In other diseases, the appearance of the sign indicates an involvement of the meninges. Thus in a case of typhoid fever with positive Kernig's sign, the autopsy revealed a chronic leptomeningitis, and in a case of lumbar spondilitis, a spinal meningitis. It is less constant in children than in adults and cannot be elicited when paralysis sets in, but may reappear when the paralysis subsides. A negative test does not exclude meningitis, but a positive one indicates meningeal involvement with great certainty.—*Interstate Medical Journal.*

LEONTIASIS OSSEA DEVELOPING IN A CHILD WITH DIABETES INSIPIDUS, AND THE PROBLEM OF ETIOLOGY.*

BY LOUIS CURTIS AGER, M.D.,
Brooklyn.

The following clinical history is presented as a basis for discussion:

F. A. L., male, born in Washington, D. C., January, 1903; second child of three; other two in good health.

Family History.—Excellent New England ancestry on both sides, with no hereditary taints of any kind.

Personal History.—Breast-fed about one year. At six months a brief gastroenteric disturbance. At eighteen months had a severe attack of colitis, which did not yield to treatment until the child was brought north. The next summer—at two and one-half years—the child had an abnormally large appetite with some digestive trouble. In July he began to be very irritable, lost weight, and developed marked abdominal distension. Again taken north. At this time patient had some eczema about the head, the liver was enlarged, severe stomatitis. The abnormal appetite and tympanites continued, mesenteric and inguinal glands greatly enlarged, morphine used at intervals to control abdominal pain. This attack lasted about two months and a tentative diagnosis of tubercular peritonitis was made by two physicians. During the winter there was a gradual improvement, and in March, 1906, at three years of age, the boy was about normal except for more or less stomatitis. In July—at three and one-half years—there was a sudden increase in the stomatitis with severe vomiting and fever. During this attack, which lasted about ten days, he began to have intense thirst and probably polyuria. The next month there was an attack of mucomembranous colitis with rapid emaciation. For some time after this there was chronic occipital headache, daily vomiting and afternoon chills and fever and some spinal rigidity at times. From this time there was definite polyuria without sugar. A diagnosis of basilar meningitis was made by one physician. During the winter there was no definite change in the boy's condition, but he did not grow worse.

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* Read at the Regular Meeting of the Medical Society of the County of Kings, June 16, 1908.

In March, 1907, at the age of four years, the boy was brought to Brooklyn and placed under my care.

Physical Examination.—Head noticably enlarged but well-shaped, not a rachitic head. Slight rachitic rosary, ankles and wrists rather large, sternum somewhat protuberant. Cervical glands enlarged. Blood normal. Skin slightly dryer than normal, very little subcutaneous fat. Arms and legs thin and weak. Patient tired very quickly and was too unsteady to run. Knee reflex exaggerated. Chest and abdomen negative.

There was at this time a slight inequality in the appearance of the eyes, which was more noticeable at some times than at others. Marked epiphora.

Although mental training of all kinds had been carefully avoided, the boy was very bright and observant for his age. He was exceedingly nervous, cried very readily, and had a bad temper, symptoms largely due to continued illness and petting.

The appetite varied, but at this time he was eating almost nothing and refused to drink any milk. He drank water in large amounts, and gagged and vomited if forced to eat.

Urination was so frequent that his mother carried a half-pint cup about with her. He would sometimes urinate three times during a meal. It was difficult to determine the amount of urine passed in twenty-four hours, as he wet his clothes at times during the day and always voided a large amount in the bed. By measuring what was collected and weighing the wet bed clothes the estimate was sixteen to eighteen pints, approximately half his weight. The specific gravity varied from a fraction over 1.000 to 1.002, clear, pale, slightly acid, no sugar, no albumin. In a urine of this character it was difficult to estimate with any accuracy the total urea on account of the wide possibility of error, but the amount was apparently below the average for a child of that age. When the diet was considered, however, the small amount was readily explained.

Treatment.—Careful observation revealed certain facts. The mother was so overconscientious in her desire to take care of the boy that the nervous tension was apparent all the time. She talked about his various symptoms in his presence and made him aware of her anxiety in many ways. She also had a great fear of his catching cold and therefore he was suffocated at night and taken out only during pleasant weather. As a result of these observations he was placed under the care of another member of the family, and slept every night in an unheated room with the windows open. This was continued all the following winter, and he also played outdoors regardless of the weather. His condition was never discussed in his presence and he was put on a regular simple diet, which he was gently but positively compelled to take.

Medication.—Thyroid and adrenalin were tried for a short time, but without any apparent effect. The only other medication was some simple bitter tonics and iron now and then.

Under this treatment there was a decided gain in weight, nutrition, and nerve poise.

In the early spring of 1908 the boy began to fail again. His appetite became poor, he lost weight, and became more irritable. In April he was again brought to the city to be under my care. At this time he weighed thirty-four pounds—two pounds more than one year before. The nutrition of the skin and the general appearance were decidedly better than a year before.

There was, however, a peculiar appearance about the face which it was difficult to account for at first sight. Careful examination showed that there was a marked bulging of the whole of the right frontal malar and the upper part of the right superior maxillary bone. As a result the whole of the orbit was thrust forward and the right eye appeared to be larger than the left.

The first thought was of a tumor of the orbit, although there were no eye symptoms. Dr. Henry M. Smith examined the eyes and found them entirely normal. Dr. Tilney found no indications of intracranial tumor, or cerebral irritation of any kind. Skiagrams, however, made by Dr. Wallace, revealed the true state of affairs. There is apparently no tumor, but there is a marked thickening of the frontal bone and also of the orbital plate of the malar bone. It is, of course, impossible to state accurately at what time this bone proliferation began, but the change in the facial contour shows that it has been progressive during the past year.

Unfortunately, this boy proved to be peculiarly susceptible to the X-ray, and although he was only exposed for two minutes on one day and three minutes the next he developed quite a severe burn from which he has not yet recovered.

Summary of Case History.—A five-year-old boy with a history suggesting a meningitis of some kind at two years, diabetes insipidis for over two years and a localized progressive bone hypertrophy for one year.

Diagnosis.—In 1856, and more fully in 1877,[1] Virchow described, under the name of leontiasis ossea, a hypertrophic disease of the bones of the skull. This must not be confused with the leontiasis of leprosy, due to a hypertrophy of the soft parts. Although the term "leontiasis" naturally suggests a more or less symmetrical condition. Kanaval[2] defines it as follows: "A localized or diffuse hypertrophy of any or all the bones of the cranium and face." It is generally admitted that this disease is closely related to acromegaly and probably to gigantism, but no one has yet shown the exact differential points, and a study of the reported cases seems to indicate that the three diseases, or, rather, the three sets of symptoms, may be present in the same patient, as in the case of "The Giant Wilkins," and also perhaps in the case of V. C. Thomas.[3] Among the 50 cases reviewed by Kanaval the number and situation of the bones involved varies greatly, but, as a rule, the deformity was not symmetrical. In a large percentage of the cases epiphora or dacryocystitis was noted, as in the case here presented. This symptom is due to the bone hypertrophy obliterating the various foramina.

Age.—From the figures given by Kanaval, leontiasis ossea seems to be a disease of childhood. The age of onset is given in 34 cases; of these 8 developed before the age of ten, 5 between ten and fifteen, and 4 from fifteen to twenty. In all the cases in which the development was reported as beginning after the tenth year, the condition had existed for a number of years before being observed. It is, therefore, quite possible that the actual hypertrophy might have begun some years before being noticed by the patient's family. In view of these facts it seems strange that a disease, essentially developmental, and beginning in a majority of cases in childhood, should not be described in the books on children's diseases. Yet such is the fact. Neither acromegaly nor leontiasis is mentioned in the indices of any of the ordinary text-books of children's diseases, and even Pfaundler, in his four volume work gives no space to these conditions.

Etiology.—There are four pathological hypertrophies—gigantism, acromegaly, leontiasis ossea and Von Recklinghausen's disease—in which the etiology is unknown, but is attributed to some abnormal activity of the pituitary gland. Authors vary in their views, but all recognize the theoretical relationship. Hirt,[4] in speaking of acromegaly, says: "Since we know nothing of the function of the hypophysis this finding" (its increase in size) "has thus far proved of little value for the understanding of the pathogenesis of the disease." Kanaval says, in a regard to leontiasis: "A study of the reports upon the pituitary gland shows that it has not been observed in a sufficient number of cases to form any basis of reasoning, . . . although the asumption is worthy of further study." Dr. Robt. Abbe[5] last fall reported to the New York Practitioners Society a case of acromegaly with a tumor of the pituitary gland, and in the discussion Dr. A. J. McCosh reported that Eiselberg had removed a large pituitary tumor in a similar case with marked general improvement, and that Horsley had operated in a number of cases. V. C. Thomas says: "The preponderance of opinion points to the fact that there is a secretion produced in the prehypophysis intimately connected with the overgrowth of the connective tissue and bony framework of the body."

The Pituitary Gland.—As Hirt states, practically nothing is known in regard to the physiology of this organ. It has been removed in dogs with varying results, which give no help in this relation. In 1744, and later Swedenborg[6] stated that the pituitary gland produced an internal secretion which governs blood formation in some way. Leydig,[7] in 1852, in the study of certain fishes, concluded that the gland had some definite part in the elaboration of the blood. Virchow, in 1857, called attention to the fact that it is almost the most constant of formations in the whole series of vertebrata and that it must, therefore, "represent an essential link in the development of these animals."

On the other hand, we must consider the work done by Schaefer and Herring[8] and others, which seems to show that the extract of the pituitary gland has a direct excitor action upon the kidney epithelium aside from the action upon the blood-pressure. These findings support the conclusions of certain clinical investigators who connect disturbances of the gland with the various forms of polyuria. In this connection Schaefer and

Herring say: "Even if the epithelial portion of the gland may have some relation to acromegaly it would not invalidate the finding of these experiments." That there may be some interrelation between the two pathological conditions is a logical conclusion from the fact that in some cases of acromegaly polyuria is present (Semon)[9] and that Byron Bramwell[10] has reported cases of tumor of the gland accompanied by polyuria.

Finally, presenting a different aspect of the question, there is submitted the case here reported, apparently the first case recorded in which the hyperostosis has followed the polyuria.

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TREATMENT OF INFLUENZA IN CHILDREN.—Breton (*Rev. Mens. des Mal. de l'Enf.*, November, 1907) makes the following suggestions with reference to treatment: During epidemics, the isolation of grippe patients is recommended, even of convalescents. Disinfection of the rooms is of value. Even with many patients ill in one family their separation is advisable; because some cases run a much simpler course than others. Great care is to be exercised concerning the first outing of these patients. There is special danger not only of relapses of the influenza, but of certain sequelæ, of which pulmonary congestion is the most common. For the gastrointestinal troubles, absolute limitation of diet or restriction of all food, save water, is of great value. For the pulmonary troubles, hot packs, mustard sinapisms or hot baths are recommended. The author finds the phosphate of guaiacol of great value in the treatment of influenza, given in doses of 4 to 7 grains per diem, according to age. Convalescence is to be watched very particularly and signs of fresh infection are to be carefully searched for. For the adenopathies, the author finds raw bone marrow of great value.—*Interstate Medical Journal.*

SOME CONTRIBUTIONS TO THE CALORIMETRIC METHOD OF INFANT FEEDING.*

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I. INTRODUCTORY REMARKS.

The problem of infant feeding has always been recognized as one of paramount importance. A vast amount of knowledge and experience has been accumulated, but up to the present time no method has been accepted as final.

In the following paper an attempt is made by the writer to approach this complex problem by using the exact methods of mathematical reasoning to combine the established results of physiological and pathological research with the facts and observations based on clinical experience.

The laws and rules laid down in this paper are not presented as a final solution of the problem, because many important factors are still evading mathematical representation and have to be judged by clinical experience only, which, supreme as it ranks, is gained and imparted with difficulty.

We shall not discuss in this paper the necessity of obtaining for purposes of infant feeding a supply of fresh, pure, wholesome milk of good quality, because the necessity is evident, and the possibility of producing such milk has been demonstrated by the "medical milk commissions" now organized in different cities throughout the country; we shall merely try to answer the question, How shall such pure wholesome cow's milk be utilized as infant's food?

We must remain conscious of the fact that cow's milk is an unnatural food for the infant. It will remain so even after it is "modified." The chemical and biological qualities of cow's milk and human milk differ, and all attempts to produce a cow's milk modification that will be identical with mother's milk are bound to be failures. Even if these efforts were successful in so far as to bring about a product of similar chemical composition, the physiological value of the apparently identical product would be different. The action of the hydrochloric acid and the rennet ferment produces a totally different curd in either case, etc. But the removal of this apparently formidable disadvantage of cow's milk by certain additions (lime water, cereal dilutions, citrate of sodium) is only another fruitless effort to imitate a specific biological product. And it is not by imitation, but by adaptation that this problem may be solved. To get the same results in artificial feeding as in breast feeding, we must not strive to change cow's milk to mother's milk—a hopeless task—but we must try to accustom the infant to the unnatural food offered to it by gradually training the digestive and assimilative organs and also the organs of elimination to use it with advantage and impunity. The composition of mother's milk should be a guide to us, especially when we start artificial feeding, but as soon as the starting point has been determined (that is, a food that is well borne) we have to gradually diminish the diluent and by other equally gradual changes in the composition and quantity of the modified milk meet the slowly increasing capabilities and requirements of the infant, which are determined not by schematic feeding, but by clinical observation and physiological laws.

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* Read before the Newark Medical League, September 14, 1908.

The average cow's milk contains:—

3.5 per cent. total proteid
4.0 " " fat
5.0 " " sugar

Human milk varies widely in composition:—

Proteids	0.09 - 1.08	
Fat	2.75 - 4.65	
Sugar	5.50 - 7.03	(Kerley)

The low proteid percentage of human milk will prompt us to start artificial feeding with a low proteid percentage of cow's milk by diluting it with three times the amount of water, and in infants of a weakly constitution the dilution can be carried even further. The ability to digest larger totals and higher percentages of casein and lactalbumin, the chief proteids of milk, will be acquired by the infant by a very gradual and tentative increase in the proteid percentage, by maintaining proper intervals between feedings and by a correct hygienic management of the infant (fresh air, cleanliness, regularity and rest). If we increase the proteid percentage too rapidly, clinical symptoms will tell us that we are at fault (indigestion, vomiting, cramps, undigested curds).

The practice of thinking in percentages, when speaking of milk and milk modifications, we owe to Dr. Rotch of Boston. By mentioning the percentages of fats, proteids and sugar we can describe any milk modification accurately. American pediatrists have accepted this method universally and have brought percentage feeding to a high state of perfection. It is clear that by working with percentages the gradual adaptation of the food can be carried out with a minute precision, and that this method allows of a very fine gauging of the digestive capabilities of the infant.

While we thus find what food the infant is able to digest, percentage feeding does not teach us what the infant needs for proper growth, which food elements are required, what amount of each will have to be supplied, and how much total food must be given.

These questions have been generally answered by feeding according to the schedules furnished by experienced infant feeders. Unfortunately, these schedules differ quite markedly and reflect largely the individual views of their authors. Working along different lines continental investigators recently introduced a new principle into infant feeding.

Camerer, Rubner and Heubner were the first to use the dynamic value of the food, expressed in calories, as a factor to determine the dynamic requirements of the infant.

Heubner determined the number of calories per day, per kilogram of body weight necessary to insure proper development in normal infants. This he named the energy quotient and found it to be 100 calories for the breast-fed infant, 120 calories for the artificially fed. This energy quotient remains about the same from the end of the third week to the end of the sixth month; then it gradually diminishes to about 80 or 85 at the end of the first year. An energy quotient of 70 will maintain a weight equilibrium.

Others have found energy quotients of from 100 at the beginning to 80 at the end of the first year, a satisfactory working basis for the nutritional needs of the infant.

The use of the energy quotient has thrown a glaring light on many reputed feeding schedules and shown them to be productive of overfeeding. This was apparently the prevalent fault in American feeding methods. It is with great reluctance that

American pediatrists as a whole have welcomed this addition to our scientific armamentarium. They emphasize that the energy quotient teaches only how much caloric value the daily total food supply must represent, but that it does not say whence these calories may be derived; how much from proteid, how much from fats, how much from carbohydrates. We know that some proteids are absolutely necessary and that fats and carbohydrates can substitute each other only to a limited extent. The energy quotient does not inform us on this, neither does it consider the inorganic constituents of food. These questions will have to be answered by additional investigation.

The question of proteids was taken up by T. G. Allen (ARCHIVES OF PEDIATRICS, December, 1907). He tried to establish a minimum standard, which may be defined as the amount of proteid just sufficient to provide for the cell growth and cell repairs in the tissues of the infant.

If we transform his reasoning into the metric system and define the proteid quotient as the number of grams of proteid needed for every kilogram of the child's weight, we get the following figures:—

AGE.	PROTEID QUOTIENT.
First week	1.0
Second week	1.5
Third week	2.0
Fourth week	2.5
Second to twelfth month	2.5, slowly rising to 3.3

II. MATHEMATICAL STUDIES IN INFANT FEEDING.

I have referred to percentage feeding, caloric and proteid requirements of the infant in the preceding pages, not only because they are important contributions on the subject, but because these methods may be welded together in form of a few laws that will govern the fundamental problems of infant feeding. The following considerations are based upon a percentage of cow's milk in proteids of 3.5 and in sugar of 5.0; the final formulæ are of general applicability no matter which energy quotient or proteid quotient may be decided upon. These two factors are given in the metric system, while the other values may be expressed either in ounces or in grams.

The following symbols are used:— .

a proteid percentage of food (modified milk).
b fat percentage of food.
c sugar percentage of food.
p proteid quotient, *i.e.*, grams of proteid needed per kilogram and day.
e energy quotient, *i.e.*, calories needed per kg. and day.
w weight of child.
t quantity of food per die.
k caloric value of 1 kg. of modified milk.
l amount of milk sugar added to produce desired sugar percentage of modified milk.
m amount of whole milk needed to prepare milk modification.
f fat percentage of top milk needed to prepare milk modification.

From the definition of the proteid quotient it follows that the following relations exist:—

$$p\,w = 10\,a\,t$$

therefore

$$a = \frac{p}{10} \cdot \frac{w}{t} \qquad \text{(formula 1.)}$$

or expressed in words: The proteid percentage of a milk, which shall supply the minimum standard amount of proteid, is equal to one-tenth the proteid quotient, multiplied by the quotient w/t. (w and t may be expressed in kg. or ounces.)

Example 1. A child, ten weeks old, weighing 11 pounds (= 176 ounces) shall be fed 28 ounces a day; what proteid percentage must the milk have to supply sufficient proteid?

$$p = 2.5 \qquad w = 176 \qquad t = 28$$

$$a = \frac{2.5}{10} . \frac{w}{t} = \frac{1}{4} . \frac{w}{t} = \frac{1}{4} . \frac{176}{28} = 1.5 \text{ per cent.}$$

(B.) It is further self-evident that the following relation exists:—

$$tk = ew$$

therefore

$$k = e\frac{w}{t} \qquad \text{(formula 2.)}$$

or expressed in words: The caloric value of 1 kg. of milk, which shall supply an energy quotient e is equal to this energy quotient, multiplied by the quotient w/t. (w and t may be expressed in kg. or ounces.)

Example 2. A child weighing 11 pounds (= 176 ounces) shall be fed 28 ounces a day; what caloric value must 1 kg. of milk fed to this infant represent, if we feed according to standard caloric requirements? (e = 100.)

$$k = e\frac{w}{t} = 100\frac{176}{28} = 628 \text{ calories.}$$

(C.) The caloric value of 1 kilogram of milk is equal to the sum of the calories of the constituent proteids, fats and carbohydrates:—

$$k = 41a + 93b + 41c \qquad \text{(formula 3.)}$$

In this equation the values k and a may be determined by the formulæ 1 and 2; c is generally raised in milk modifications by addition of milk sugar to 6 or 6.5 or 7.0. Let us assume that c = 6. Then the formula reads:—

$$k = 41a + 93b + 246$$

therefore

$$b = \frac{1}{93}(k - 41a - 246)$$

which formula enables us to determine the fat percentage of a milk mixture, of which the caloric value per kg., the proteid percentage and the sugar percentage are known.

Example 3. $k = 628$ $a = 1.5$ $c = 6.0$ $b = ?$

$$b = \frac{1}{93}(628 - 41 \times 1.5 - 246) = 3.4 \text{ per cent.}$$

(D.) In practical application of infant feeding the question arises: How much whole milk (m) is needed to prepare by dilution a modified milk of the proteid percentage a, if the total quantity of the modified milk shall be t?

The answer is very simple, considering the lengthy remarks of the authors on the subject.

$$m = \frac{t}{7}.2a \qquad \text{(formula 4.)}$$

It may sometimes be desirable to determine the value of m from the known fat percentages of the top milk used (f) and of the resulting milk modification (b):—

$$m = \frac{tb}{f}$$

Example 4. 28 ounces of modified milk shall be prepared. The desired proteid percentage is 1.5 per cent. How much whole milk must be used?

$$m = \frac{t}{7} . 2a = \frac{28}{7} . 2 \times 1.5 = 12 \text{ ounces.}$$

(E.) When the proteid percentage is reduced by dilution, the carbohydrates and fats are correspondingly reduced in percentages. To prevent an excessive reduction of fat percentages we have to resort to the use of top milk, which will be discussed under (F). The diminution of the sugar percentage is corrected by subsequent addition of milk sugar in such amount, that the desired percentage (c) is obtained. The amount (1) is determined by the following formula:—

$$l = \frac{1}{100} (tc - 5m) \qquad \text{(formula 5.)}$$

Example 5. 28 ounces of modified milk have been prepared by diluting 12 ounces of whole milk. It is desired to give the mixture a sugar percentage of 6. How much lactose must be added?

$$l = \frac{1}{100} (28 \times 6 - 5 \times 12) = \frac{1}{100} (168 - 60) = 1.08 \text{ ounces.}$$

(F.) While it is possible to obtain any desired proteid percentage by dilution and any desired sugar percentage by addition of lactose, we have to adopt different means to secure convenient fat percentages. Chapin's method to obtain milk of different fat percentages is based on the use of "top milks." By removing an increasing number of ounces (with the Chapin dipper) from the top of the commercial quart bottle of milk, in which the cream has risen by allowing it to stand for about four hours, milk of decreasing fat percentages is obtained.

The following table from Chapin (somewhat modified) will give the necessary data:—

Top Ounces Mixed.	Per Cent. Fat.
2	24.
3	22.5
4	21.4
5	19.2
6	16.8
7	14.9
8	13.3
9	12.
10	10.9
12	9.3
14	8.2
16	7.3
18	6.6
20	6.1
22	5.6
24	5.3
26	5.
28	4.7
30	4.5
32	4.25

If milk is very rich (5 per cent.) or very poor (3 per cent.), about 2 ounces more or 2 ounces less should be taken respectively to get suitable percentages of fat.

(G.) The next question that presents itself is: What top milk shall we select for the preparation of our modified milk in a given case?

The answer is given by the formula

$$f = \frac{7b}{2a}$$

in which "f" is the fat percentage of the desired top milk "a" and "b," the proteid and fat percentages of the modified milk to be prepared.

Example 6. A modified milk shall be prepared, containing 1.5 per cent. proteid and 3.4 per cent. fat. What percentage of fat must the top milk have that will yield these percentages by subsequent dilution?

$$f = \frac{7b}{2a} = \frac{7 \times 3.4}{2 \times 1.5} = \frac{23.8}{3} = 7.9 \text{ per cent.}$$

According to Chapin's table this top milk is obtained by dipping off and mixing the top 15 ounces of milk after the cream has risen.

The six formulæ evolved in the preceding paragraphs enable us, therefore, to determine the proteid and fat percentages of the food of an infant, whose weight is known and whose total daily food capacity has been determined from his age. They also show how the desired milk modification may be prepared.

The following table contains the six formulæ given above, which will answer all questions ordinarily presenting themselves, but for the purpose of completeness other formulæ are added, derived from the original six by purely mathematical operations.

$$a = \frac{p}{10}\,\frac{w}{t} = \frac{7m}{2t}$$

$$k = e\,\frac{w}{t} = 10a\,\frac{e}{p} = 41a + 93b + 41c$$

$$b = \frac{1}{93}\,(k - 41a - 41c) = a\left(0.1075\,\frac{e}{p} - 0.44\right) - 0.44c = \frac{2af}{7}$$

$$t = \frac{wp}{10a} = \frac{7m}{2a} = \frac{mf}{b}$$

$$m = \frac{wp}{35} = \frac{t}{7} \,.\, 2a = \frac{tb}{f}$$

$$f = \frac{7b}{2a} = 0.376\,\frac{e}{p} - 1.54\left(1 + \frac{c}{a}\right)$$

$$e = \frac{kt}{w} = \frac{t}{w}\,(41a + 93b + 41c)$$

$$p = \frac{10at}{w} = \frac{35m}{w}$$

$$l = \frac{1}{100}\,(tc - 5m) = \frac{t}{100}\left(c - \frac{10a}{7}\right)$$

$$\frac{e}{p} = \frac{k}{10a} = \frac{1}{10a}\,(41a + 93b + 41c)$$

III.

The use to which these formulæ may be put will become evident to anyone trying to answer the following simple problems by means of calculation. Some of these problems are somewhat out of the ordinary, but they are intended to show the accuracy and completeness of the system.

Examples illustrating formula

$$a = \frac{p}{10} \frac{w}{t}$$

(1) A child, fourteen weeks old ($p = 2.5$), weighing 13 pounds (= 208 ounces), shall be fed 28 ounces a day (7 feedings of 4 ounces each). What proteid percentage must the milk have to supply sufficient proteid?

$w = 208$ | $t = 28$

$p = 2.5$ | $a = ?$

$$a = \frac{p}{10} . \frac{w}{t} = \frac{1}{4} . \frac{208}{28} = \frac{52}{28} = \frac{13}{7} = 1.8$$

Answer: 1.8 per cent.

(2) A child, ten weeks old, weighing 11 pounds (= 176 ounces), is receiving 28 ounces of modified milk a day; the proteid percentage of the modified milk is 1.25 per cent.; does the child get sufficient proteid?

$w = 176$
$t = 28$
$a = 1.25$
$p = ?$

$$a = \frac{p}{10} . \frac{w}{t}$$

$$p = \frac{10at}{w} = \frac{10 \times 1.25 \times 28}{176} = 1.99$$

Answer: The proteid quotient (*i.e.*, minimum daily proteid per kg.) for this age is 2.5; the amount of proteid supplied by this food is therefore insufficient.

(3) A child, fourteen weeks old, weighing 13 pounds (= 208 ounces) receives a modified milk of 1.5 per cent. proteid; how much modified milk must be fed daily to supply sufficient proteid?

$w = 208$
$a = 1.5$
$p = 2.5$
$t = ?$

$$a = \frac{p}{10} . \frac{w}{t}$$

$$t = \frac{pw}{10a} = \frac{2.5 \times 208}{10 \times 1.5} = 34\tfrac{2}{3}$$

Answer: The daily total will be 35 ounces, which may be given in seven feedings of 5 ounces each, or in eight feedings of 4⅓ ounces.

Illustrating formulæ:—

$$k = e \frac{w}{t}$$

$$b = \frac{1}{93} (k - 41a - 41c)$$

Example 4. A child, six months old, weighing 16 pounds (= 256 ounces), shall be fed 40 ounces of modified milk a day (seven feedings of 5¾ ounces each); what shall be the composition of the milk, if fed according to standard requirements?

Let us select a percentage of carbohydrates of 6.5 and fix the proteid quotient for this age at 2.8 and the energy quotient at 85; then it follows that

$$a = \frac{p}{10} \frac{w}{t} = 0.28 \times \frac{256}{40} = 0.28 \times 6.4 = 1.8$$

$$k = 85 \times 6.4 = 544$$

$$b = \frac{1}{93} (544 - 340.3) = 203.7 : 93 = 2.2$$

a = 1.8 per cent. proteid
b = 2.2 " " fat
c = 6.5 " " sugar

Example 5. A child, fourteen weeks old, weighing 13 pounds (= 208 ounces) receives 34⅔ ounces of modified milk, containing 1.5 per cent. proteid. It is desired to increase the proteid percentage to 1.6 without changing the actual amount of food given; how much total will have to be supplied in twenty-four hours?

$$t = \frac{pw}{10a} = \frac{2.5 \times 208}{10 \times 1.6} = 32.5$$

Answer: 32½ ounces of modified milk, containing 1.6 per cent. of proteid, will supply the same proteid as 34⅔ ounces of 1.5 per cent. proteid.

Example 6. A child, six months old, weighing 16 pounds (= 256 ounces) shall receive a milk of 2 per cent. proteid, 2.5

per cent. fat and 6 per cent. sugar; how much milk must be given daily to supply an energy quotient of 85? and how much proteid per kilo will the infant receive?

$w = 256$
$a = 2$
$b = 2.5$
$c = 6$
$e = 85$
$t = ?$
$p = ?$

$$k = 41a + 93b + 41c = 82 + 232.5 + 246 = 560.5$$

$$k = e\frac{w}{t}$$

$$t = \frac{ew}{k} = \frac{85 \times 256}{560} = 38^6/_7$$

$$p = \frac{10at}{w} = \frac{1}{256} . 20 \times 38^6/_7 = 3.0$$

Answer: The daily total should be 39 ounces; the proteid quotient is 3.0 grams per kilo body weight per day (somewhat high).

Example 7. A child, eight months old, weighing 17 pounds (= 272 ounces) receives daily 42 ounces of modified milk, containing 2.5 per cent. proteid, 3.5 per cent. fat and 6.5 per cent. sugar. Determine the proteid quotient and energy quotient. Is this a correct diet?

$w = 272$
$t = 42$
$a = 2.5$
$b = 3.5$
$c = 6.5$
$p = ?$
$e = ?$

$$p = \frac{10at}{w} = \frac{10 \times 2.5 \times 42}{272} = 3.8$$

$$k = 41a + 93b + 41c = 694.5$$

$$k = e\frac{w}{t}$$

$$e = \frac{kt}{w} = \frac{694.5 \times 42}{272} = 107$$

This infant received 3.8 grams of proteid per kg. of body weight per day (while he ought to be given about 3.0 grams per day and kilogram) and 107 calories per day and kg. (while he ought to receive not more than 80-85). This diet is therefore productive of overfeeding.

Illustrating formula:—

$$m = \frac{t}{7} . 2a = \frac{tb}{f} = \frac{wp}{35}$$

Example 8. 35 ounces of modified milk shall be prepared. The desired proteid percentage is 2.2 per cent.; how much whole milk must be used?

$$m = \frac{t}{7} . 2a = \frac{35}{7} \times 2 \times 2.2 = 22$$

Answer: 22 ounces of whole milk, diluted with 13 ounces of water, will yield 35 ounces of modified milk containing 2.2 per cent. proteid.

Example 9. 36 ounces of modified milk shall be prepared from a top milk containing 9 per cent fat. The modified milk shall contain 2.5 per cent. fat; how much whole milk must be used?

$b = 2.5$
$f = 9.0$

$t = 36$
$m = ?$

$$m = \frac{tb}{f} = \frac{36 \times 2.5}{9} = 10$$

Answer: 10 ounces of 9 per cent. top milk, diluted with 26 ounces of water, will yield a modified milk of 2.5 per cent. fat.

Example 10. 36 ounces of modified milk are obtained by diluting 10 ounces of whole milk with 26 ounces of water. What is the proteid percentage of this modified milk?

$t = 36$
$m = 10$
$a = ?$

$$m = \frac{t}{7} . 2a$$

$$a = \frac{7m}{2t} = \frac{7 \times 10}{2 \times 36} = 0.9$$

Answer: The diluted milk contains 0.9 per cent. proteid.

Example 11. 12 ounces of whole milk have been so modified by dilution that the proteid percentage has been reduced to 1.5; how much water has been added?

$m = 12$
$a = 1.5$
$t - m = ?$

$$t = \frac{7m}{2a} = \frac{7 \times 12}{2 \times 1.5} = 28$$

$$t - m = 28 - 12 = 16$$

Answer: 16 ounces of water.

Example 12. A child, three months old, weighing 12.5 pounds (= 200 ounces) shall be fed according to standard proteid requirements ($p = 2.5$); how much whole milk will this infant require in twenty-four hours?

$$m = \frac{wp}{35} = \frac{200 \times 2.5}{35} = \frac{500}{35} = 14^2/_7$$

Answer: This child will require $14^2/_7$ ounces of whole milk for the supply of the necessary proteid (minimum).

Example 13. A child, twelve months old, weighing 20 pounds (= 320 ounces), shall be fed according to standard proteid requirements ($p = 3.3$); how much whole milk will this child require in twenty-four hours?

$$m = \frac{wp}{35} = \frac{320 \times 3.3}{35} = 30.2$$

Answer: 30.2 ounces of whole milk will supply the necessary proteid.

Example 14. A child, four months old, weighing 14 pounds (= 204 ounces), is fed with a modified milk which is prepared by diluting 16 ounces of whole milk; what is the proteid quotient?

$w = 204$
$m = 16$
$p = ?$

$$p = \frac{35m}{w} = \frac{35 \times 16}{204} = 2.7$$

Answer: $p = 2.7$.

NOTE.—The amount of whole milk needed to satisfy the proteid requirements of the infant varies from 1/14 of the body weight (in the second month) to 1/10 of the body weight (at the end of the first year). This follows directly from the formula

$$m = \frac{wp}{35}$$

by substituting the respective values of p.

Illustrating formula:—

$$f = \frac{7b}{2a}$$

Example 15. A modified milk shall be prepared, containing 2 per cent. proteid and 3 per cent. fat; what percentage of fat must the top milk have that will yield these percentages by subsequent dilution?

$$f = \frac{7b}{2a} = \frac{7 \times 3}{2 \times 2} = \frac{21}{4} = 5\tfrac{1}{4}$$

Answer: The top milk should have a fat percentage of $5\tfrac{1}{4}$

per cent. This is obtained according to Chapin by dipping off and mixing the top 24 ounces.

Illustrating formula:—

$$b = a\left(0.1075\,\frac{e}{p} - 0.44\right) - 0.44c$$

Example 16. A healthy child, seven months old, shall be fed according to standard proteid and caloric requirements ($p = 2.8$; $e = 85$). It shall receive a modified milk containing 2 per cent. proteid and 6.5 per cent. sugar; what percentage of fat must the modified milk contain to give an energy quotient of 85?

$$\begin{array}{l|l} e = 85 & b = a\,(3.26 - 0.44) - 0.44c = \\ p = 2.8 & \quad 2.82a - 0.44c = \\ a = 2 & \quad 2.82 \times 2 - 0.44 \times 6.5 = \\ c = 6.5 & \quad 5.64 - 2.86 = 2.78 \\ b = ? & \end{array}$$

Answer: The modified milk must contain, in addition to 2 per cent. proteid and 6.5 per cent. sugar, 2.78 per cent. fat.

Illustrating formula:—

$$f = 0.376\,\frac{e}{p} - 1.54\left(1 + \frac{c}{a}\right)$$

Example 17. A healthy child, three months old, shall be fed according to standard caloric and proteid requirements ($p = 2.5$; $e = 100$). It shall receive a modified milk containing 1.5 per cent. proteid and 6.0 per cent. sugar; what top milk must be selected to supply the caloric requirements?

$$\begin{array}{c|c} e = 100 & a = 1.5 \\ p = 2.5 & c = 6.0 \\ \hline \frac{e}{p} = 40 & \frac{c}{a} = 4 \end{array} \qquad \begin{aligned} f &= 0.376 \times 40 - 1.54\,(1 + 4) = \\ &= 15.04 - 7.70 = 7.34 \end{aligned}$$

The top milk must have a fat percentage of 7.34.

IV. SOME IMPORTANT FACTS IN INFANT FEEDING.

By analyzing our formulæ it will be seen that we base our conclusions on the weight of the infant and the amount of food consumed in twenty-four hours. The weight is a more reliable guide of metabolic activity than the age, if we exclude some pathological conditions. The age, however, has a direct bearing on the second factor, the total consumed in twenty-four hours. This daily total is equal to the amount of one feeding multiplied by the number of feedings. The amount of milk to be given at one meal must be regulated by the gastric capacity, which is largely influenced by the age. According to Rotch the stomach grows very rapidly the first three months after birth, grows slowly in the fourth month, and is then almost quiescent for about two months. It then begins to grow again, until it has reached its adult size.

The gastric capacity of infants of the same age is greatly influenced by their weight. "The greater the weight, the greater the gastric capacity."

The following table showing the average amount of food taken at one feeding has been prepared by Rotch from a large material.

Age. (months)	Single Feeding. (ounces)
Birth	1.
1	2.35
2	3.22
3	3.96
4	4.58
5	5.28
6	5.71
7	6.18
8	6.95
9	7.54
10	7.89
11	8.07

The number of feedings should gradually be reduced from ten to five a day. The intervals should be lengthened and in the eighth month intervals of four hours between the feedings should be established.

In the foregoing pages the caloric requirements of the infantile body and the amounts of proteids needed for tissue repair and tissue building have been accurately determined. The other elements of the food, the carbohydrates and fats play an important part in the metabolism of the infant, but to what extent each of them is needed and tolerated and to what extent they may substitute each other, are questions still unsettled.

The part played by the fats has been lately very much under discussion. At one time the fats were used very liberally and were the cause of much fat indigestion, overfeeding and atrophy. Of late they are viewed with distrust, since the classical investigations of Keller, Czerny and Steinitz revealed the fact that the fat contents of the food are responsible for an increased renal excretion of ammonia. Carried beyond physiological limits and in certain pathological conditions the fats are thus productive of a "relative acidosis" (Keller) by drawing on the alkali stock of the organism. If this draining of the system of its fixed alkalies is continued for some time it leads to chronic disturbances of nutrition and finally to atrophy. The retention of alkali by the infantile organism is just as essential as the retention of nitrogen, phosphorus and of other mineral constituents. The organism having the tendency to preserve its percentage composition, a breaking down is inevitable if alkali retention fails.

In view of the startling results of these German investigators, it is not surprising to notice a complete change in the general attitude toward fats, these being lately considered as the chief offending element. It will be found, however, that by following the methods recommended in this paper, overfeeding with fat is not liable to occur.

The carbohydrates have also been the subject of much fruitful investigation. The following interesting facts have been discovered. There exists in the intestinal tract of the infant an antagonistic relation between putrefaction and fermentation. Both these processes are caused by bacterial action on the ingested food and the intestinal excretions.

Under normal conditions putrefaction does not occur in the infantile intestine (1) on account of the quick passage of the food through the intestine (2), because milk is not fit to undergo putrefaction; the carbohydrates of the milk prevent the putrefaction of the casein, or, in other words, the casein is protected from putrefaction by the preponderance of fermentation. (Hirschler and others.)

The intestinal bacteria (bacillus lactis aerogenes, bacterium coli communis, bacillus bifidus) are all producers of fermentation and not able to act proteolytic or peptonizing. The acid reaction of the intestinal contents in a state of health, caused by fermentation, excludes putrefaction. In pathological conditions the contents of the intestine are not only milk and the products of milk digestion, but also increased quantities of intestinal mucus, and the latter is very apt to putrefy. The offensive evacuations of infants suffering from gastrointestinal disorders are doubtless caused by putrefaction of intestinal secretion, the occurrence of which is aided by the diminished production of hydrochloric acid, commonly associated with such disorders. Putrefaction, then, takes place in the intestine, causing decomposition of albumins and albuminoid substances, the reaction being alkaline. The physiological importance of fermentation consists in the effect it has on the production of acids and thereby on the bacterial flora of the intestine, causing a suppression or limitation of putrefying processes. By increasing the peristalsis the products of fermentation act further inhibitory of putrefaction. Moderate degrees of fermentation are necessary to maintain physiological conditions in the intestinal tract of the infant.

This antagonistic relation between carbohydrate fermentation and protein putrefaction has long been used for therapeutical purposes in an empirical way, but only since Escherich with a clear conception of the underlying facts.

The knowledge of these facts is important for a proper use of carbohydrates in infant feeding. Many use them empirically in a routine way, but from the foregoing remarks it will be understood that the occurrence of offensive stools indicates an increase of carbohydrates in the food. For this purpose the use of cereals or cereal flours must be strongly urged. In the form of weak cereal decoctions they may be used as diluents from the beginning of the fourth month.

One half ounce of barley flour (two tablespoonfuls) to 1 pint of water, boiled thirty minutes and strained and by addition of water again filled up to 1 pint, gives a nutritional equivalent of

0.3 per cent. proteid
0.07 " " fat
2.0 " " carbohydrate (Kerley)

The nutritive value of cereal decoctions is, therefore, not insignificant.

Another reason for the use of barley water is that it calls forth the action of the diastatic ferments (of the saliva, the pancreatic juice and the succus entericus), the existence of which has been much disputed in the newborn child, but has lately been proven beyond any doubt. (Kerley, 1906.)

A further reason for the use of cereal waters from the fourth month is that they supply some iron, which is not contained in milk in sufficient quantity for the needs of the growing organism. It has been demonstrated that the liver of the newborn infant contains a store of iron, but this rapidly diminishes, which makes it imperative that the exclusive milk diet be superseded by a mixed diet, at least when the first teeth have made their appearance.

V. PRACTICAL APPLICATION. KEY TO TABLES.

By means of the formulæ given above a number of tables have been prepared, which will allow us to solve the practical problems of infant feeding without difficult mathematical operations.

Table I. gives the values of "m," *i.e.,* the amount of whole milk required *pro die* by an infant of a given weight (vertical column in pounds), whose proteid quotient has been determined clinically (horizontal headline).

Thus it will be seen at a glance that an infant weighing 12 pounds and having a proteid quotient of 2.0, will need daily 11 ounces of pure milk, and that another infant of 14 pounds with a proteid quotient of 2.5 will need a daily supply of 16 ounces of pure milk to satisfy his proteid requirements.

The three main factors to be determined by the physician are:

(1) The proteid quotient; this depends principally upon the age of the infant.

1.0 in the first week
1.5 " " second "
2.0 " " third "
2.5-3.3 from second to twelfth month.

It also depends upon the individuality and is influenced by physical conditions of health and disease. It is a measure for growth and assimilation and it evidently will be useless to increase it rapidly and to flood the system with proteids, if the organism has not been gradually prepared for their utilization. Low proteid quotients pave the way for the higher ones. Proteid quotients represent minimum proteid requirements; the amount supplied may therefore be slightly increased, but should not be exceeded considerably because proteids supplied in excess are not only utilized for growth and tissue repair, but as sources of heat and energy like fats and carbohydrates; and for these purposes fats and carbohydrates are more readily available than the proteids.

(2) The second factor to be determined is the energy quotient. This is a measure of the liberated energy, derived ultimately from the fuel value of the food and expressed in calories. The food element yielding the most calories are the fats, and the energy quotient will therefore be largely influenced by the amount of fat contained in the milk. Most of the liberated energy appears as bodily heat, and this fact will serve us as a guide in the determination of the energy quotient. From experience we know that energy quotients ranging from 100 for the first half year of life to about 75 or 80 at the end of the first year are standards for average infants. If the infant is of smaller than average size, the disproportion of body weight and body surface will require increased heat production and the energy quotient has to be chosen higher than that of an average infant of the same age. Again, if the child is unusually heavy it will fare better with a lower energy quotient.

Another factor influencing the energy quotient is the muscular activity of the infant. A higher energy quotient will be justified in a healthy, vigorous, active child that spends most of its time outdoors than in the fat, dull, listless baby, a type that owes its existence chiefly to overfeeding. In these latter cases, and especially when the overfeeding with fat has led to a draining off of the fixed alkalies and the establishment of a relative acidosis, the remedy lies in a food yielding a low energy quotient and composed chiefly of carbohydrates and proteids but low in fats.

(3) The third factor to be determined by the physician is the percentage of the food in proteids. This, in ordinary cases, gives an insight into the power of the digestive processes. But this variable degree of concentration of the milk has quite naturally an effect upon the daily totals and the number of feedings, and must be brought to correspond with the varying gastric capacities of different ages and different individuals. If we remember our object, stated in the introductory remarks, to gradually and stead-

ily increase the proteid percentage from the point of toleration to full strength, the difficulty of harmonizing all these requirements becomes evident.

The following empirical rule will be found to conform to every practical requirement and will facilitate the use of the tables. In the first four weeks the proteid percentage shall be so chosen that it equals the respective value of "m," divided by four times the proteid quotient. It will be found that by using the Table I. this computation need not be carried out, as a mere transposition of the decimal point (division by 10) of the figures in the column headed by $p = 2.5$ will yield the result at a glance.

From Table I. we learn that in the case of a child about ten days old, weighing 8 pounds, 5.5 ounces of whole milk will be needed for the preparation of its modified milk. The above mentioned rule says that—

$$a = \frac{m}{4p} = \frac{5.5}{4 \times 1.5} = 0.91$$

This figuring may be spared by going two columns further to the right, where, under 2.5 for the weight of 8 pounds, will be found $m = 9.1$; this divided by 10 gives the percentage to be chosen.

This rule allows us to make a rapid conclusion of the daily total "t." "t," *i.e.,* the total amount of the modified milk, is equal fourteen times the proteid quotient (under the supposition made above). In the first week the daily total will therefore equal 14 ounces; in the second, 21 ounces; in the third, 28 ounces; in the fourth, 35 ounces. In the above example the daily total will be 21 ounces. By diluting 5.5 ounces of whole milk with enough water to make 21 ounces of modified milk the proteid percentage will be lowered to 0.91.

In another case of a child of 11 pounds, in the third week of life $m = 10$, $a = 1.26$, $t = 28$.

There remains one difficulty, which shall be illustrated by an example.

A child, 13 pounds, first week of life, will require, according to Table I., 5.9 ounces of whole milk, $m = 5.9$; the proteid percentage to be chosen according to the foregoing rule would be equal to 1.49, and this percentage is rather high to start with. The difficulty in this case is caused by the abnormally high weight of the child. In cases of this kind we can change the values of "a" and "t" advantageously by multiplying "a" by $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$ or $\frac{5}{6}$, and thereby reduce its value, and correspondingly multiply the value for "t" with the reciprocal fraction.

After the fourth week of life the proteid percentage is best chosen equal to m/10. The daily total will then remain unchanged, 35 ounces, regardless of the amount of the proteid quotient. By dividing these 35 ounces into 10, 9, 8, 7, 6 or 5 feedings, it will be found that the growing capacities of the stomach can be easily and accurately accommodated. The constant daily volume of the food will naturally go hand in hand with a steady increase of proteid percentage as the infant's growth goes on. Example—

w = 14 pounds Age three months.
p = 2.6

m = 16.6 ounces of whole milk
a = 1.66 per cent. proteid
t = 35 ounces

When in the later months of infancy a greater bulk of food becomes desirable, this may be furnished by adding cereal gruels or jellies to the milk. Considering the great tolerance of the infant for carbohydrates, it will not be necessary to estimate percentages, but it will be advisable to furnish less sugar to the infant in this case.

Table II. consists of three sections—a, b and c—and will assist us in obtaining the top milk yielding the chosen energy quotient. Table II. a shows a vertical column of energy quotients, running from 60 to 120 and a horizontal row of proteid quotients ranging from 1.0 to 3.3. In Table II. b we find a vertical column of proteid percentages from 0.5 to 3.5 and a horizontal succession of three carbohydrate percentages 6.0, 6.5 and 7.0. Table II. c is Chapin's table of top milks, extended for percentages below 4.1 per cent.

An example will illustrate the use of the table:—

Example: The proteid percentage and sugar percentage of a modified milk are 2.3 and 6.5, respectively; it is desired to feed an energy quotient of 90 and a proteid quotient of 2.5; what top milk will meet these requirements?

By following up e = 90 on Table II. a we find $F_1 = 13.54$, and similarly we find on Table II. b by following up a = 2.3 and c =

TABLE I.

	1.0	1.5	2.0	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	p
7	3.2	4.8	6.3	8.0	8.3	8.6	9.0	9.3	9.6	9.9	10.2	10.6	
7¼	3.3	5.0	6.6	8.3	8.6	9.0	9.3	9.6	9.9	10.3	10.6	10.9	
7½	3.4	5.1	6.9	8.6	8.9	9.3	9.6	9.9	10.3	10.6	10.9	11.3	
7¾	3.5	5.3	7.1	8.9	9.2	9.6	9.9	10.3	10.6	11.0	11.3	11.7	
8	3.7	5.5	7.3	9.1	9.5	9.9	10.2	10.6	11.0	11.3	11.7	12.1	
8¼	3.8	5.7	7.5	9.4	9.8	10.2	10.6	10.9	11.3	11.7	12.1	12.4	
8½	3.9	5.8	7.8	9.7	10.1	10.5	10.9	11.3	11.9	12.0	12.7	13.1	
8¾	4.0	6.0	8.0	10.0	10.4	10.8	11.2	11.6	12.0	12.4	12.8	13.2	
9	4.1	6.2	8.2	10.3	10.7	11.1	11.5	11.9	12.3	12.8	13.2	13.6	
9¼	4.2	6.3	8.5	10.6	11.0	11.4	11.8	12.3	12.7	13.1	13.5	14.0	
9½	4.3	6.5	8.7	10.9	11.3	11.7	12.2	12.6	13.0	13.5	13.9	14.3	
9¾	4.4	6.7	8.9	11.1	11.6	12.0	12.5	12.9	13.4	13.8	14.3	14.7	
10	4.6	6.9	9.1	11.4	11.9	12.3	12.8	13.1	13.7	14.2	14.6	15.1	
10¼	4.7	7.0	9.4	11.7	12.2	12.7	13.1	13.6	14.1	14.5	15.0	15.5	
10½	4.8	7.2	9.6	12.0	12.5	13.0	13.4	13.9	14.4	14.9	15.4	15.8	
10¾	4.9	7.3	9.8	12.3	12.8	13.3	13.8	14.3	14.7	15.2	15.7	16.2	
11	5.0	7.5	10.0	12.6	13.1	13.6	14.1	14.6	15.1	15.6	16.1	16.6	
11¼	5.1	7.7	10.3	12.9	13.4	13.9	14.4	14.9	15.4	15.9	16.5	17.0	
11½	5.2	7.9	10.5	13.1	13.7	14.2	14.7	15.2	15.8	16.3	16.8	17.3	
11¾	5.4	8.1	10.7	13.4	14.0	14.5	15.0	15.6	16.1	16.6	17.2	17.7	
12	5.5	8.2	11.0	13.7	14.3	14.8	15.4	15.9	16.5	17.0	17.6	18.1	
12¼	5.6	8.4	11.2	14.0	14.6	15.1	15.7	16.2	16.8	17.4	17.9	18.5	
12½	5.7	8.6	11.4	14.3	14.9	15.4	16.0	16.6	17.1	17.7	18.3	18.9	
12¾	5.8	8.7	11.7	14.6	15.2	15.7	16.3	16.9	17.5	18.1	18.7	19.2	
13	5.9	8.9	11.9	14.9	15.5	16.0	16.6	17.2	17.8	18.4	19.0	19.6	
13¼	6.1	9.1	12.1	15.1	15.7	16.4	17.0	17.6	18.2	18.8	19.4	20.0	
13½	6.2	9.3	12.3	15.4	16.0	16.7	17.3	17.9	18.5	19.1	19.7	20.4	
13¾	6.3	9.4	12.6	15.7	16.3	17.0	17.6	18.2	18.9	19.5	20.1	20.7	
14	6.4	9.6	12.8	16.0	16.6	17.3	17.9	18.6	19.2	19.8	20.5	21.1	
14¼	6.5	9.8	13.0	16.3	16.9	17.6	18.2	18.9	19.5	20.2	20.8	21.5	
14½	6.6	9.9	13.3	16.6	17.2	17.9	18.6	19.2	19.9	20.5	21.2	21.9	
14¾	6.7	10.1	13.5	16.9	17.5	18.2	18.9	19.6	20.2	20.9	21.6	22.3	
15	6.9	10.3	13.7	17.1	17.8	18.5	19.2	19.9	20.6	21.3	21.9	22.6	
15¼	7.0	10.5	13.9	17.4	18.1	18.8	19.5	20.2	20.9	21.6	22.3	23.0	
15½	7.1	10.6	14.2	17.7	18.4	19.1	19.8	20.5	21.3	22.0	22.7	23.4	
15¾	7.2	10.8	14.4	18.0	18.7	19.4	20.2	20.9	21.6	22.3	23.0	23.8	
16	7.3	11.0	14.6	18.3	19.0	19.7	20.5	21.2	21.9	22.7	23.4	24.1	
16¼	7.4	11.1	14.9	18.6	19.3	20.1	20.8	21.5	22.3	23.0	23.8	24.5	
16½	7.5	11.3	15.1	18.9	19.6	20.4	21.1	21.9	22.6	23.4	24.1	24.9	
16¾	7.7	11.5	15.3	19.1	20.0	20.7	21.4	22.2	23.0	23.7	24.5	25.3	
17	7.8	11.7	15.5	19.4	20.2	21.0	21.8	22.5	23.3	24.1	24.9	25.6	
17¼	7.9	11.8	15.8	19.7	20.5	21.3	22.1	22.9	23.7	24.4	25.2	26.0	
17½	8.0	12.0	16.0	20.0	20.8	21.6	22.4	23.2	24.0	24.8	25.6	26.4	
17¾	8.1	12.2	16.2	20.3	21.1	21.9	22.7	23.5	24.3	25.1	26.0	26.8	
18	8.2	12.3	16.5	20.6	21.4	22.2	23.0	23.9	24.7	25.5	26.3	27.2	
18¼	8.3	12.5	16.7	20.9	21.7	22.5	23.4	24.2	25.0	25.9	26.7	27.5	
18½	8.5	12.7	16.9	21.1	22.0	22.8	23.7	24.5	25.4	26.2	27.1	27.9	
18¾	8.6	12.9	17.1	21.4	22.3	23.1	24.0	24.9	25.7	26.8	27.4	28.3	
19	8.7	13.0	17.4	21.7	22.6	23.5	24.3	25.2	26.1	26.9	27.8	28.7	
19¼	8.8	13.2	17.6	22.0	22.9	23.8	24.6	25.5	26.4	27.3	28.2	29.0	
19½	8.9	13.4	17.8	22.3	23.2	24.1	25.0	25.9	26.7	27.6	28.5	29.4	
19¾	9.0	13.5	18.1	22.6	23.5	24.4	25.3	26.2	27.1	28.0	28.9	29.8	
20	9.1	13.7	18.3	22.9	23.8	24.7	25.6	26.5	27.4	28.3	29.2	30.1	
20¼	9.3	13.9	18.5	23.1	24.1	25.0	25.9	26.8	27.8	28.7	29.6	30.5	
20½	9.4	14.1	18.7	23.4	24.4	25.3	26.2	27.2	28.1	29.1	30.0	30.9	
20¾	9.5	14.2	19.0	23.7	24.7	25.6	26.6	27.5	28.5	29.4	30.4	31.3	
21	9.6	14.4	19.2	24.0	25.0	25.9	26.9	27.8	28.8	29.8	30.7	31.7	
21¼	9.7	14.6	19.4	24.3	25.3	26.2	27.2	28.2	29.1	30.1	31.1	32.1	
21½	9.8	14.7	19.7	24.6	25.6	26.5	27.5	28.5	29.5	30.5	31.5	32.4	
21¾	9.9	14.9	19.9	24.9	25.9	26.8	27.8	28.8	29.8	30.8	31.8	32.8	
22	10.1	15.1	20.1	25.1	26.1	27.1	28.2	29.2	30.2	31.2	32.2	33.2	
22¼	10.2	15.3	20.3	25.4	26.4	27.5	28.5	29.5	30.5	31.5	32.6	33.6	
22½	10.3	15.4	20.6	25.7	26.7	27.8	28.8	29.8	30.9	31.9	32.9	33.9	
22¾	10.4	15.6	20.8	26.0	27.0	28.1	29.1	30.2	31.2	32.2	33.3	34.3	
23	10.5	15.8	21.0	26.3	27.3	28.4	29.4	30.5	31.5	32.6	33.6	34.7	
23¼	10.6	15.9	21.3	26.6	27.6	28.7	29.8	30.8	31.9	32.9	34.0	35.1	
23½	10.7	16.1	21.5	26.9	27.9	29.0	30.1	31.2	32.2	33.3	34.4	35.5	
23¾	10.9	16.3	21.7	27.1	28.2	29.3	30.4	31.5	32.6	33.7	34.7	35.8	
24	11.0	16.5	21.9	27.4	28.5	29.6	30.7	31.8	32.9	34.0	35.1	36.2	
24¼	11.1	16.6	22.2	27.7	28.8	29.9	31.0	32.1	33.3	34.4	35.5	36.6	
24½	11.2	16.8	22.4	28.0	29.1	30.2	31.4	32.5	33.6	34.7	35.8	36.9	
24¾	11.3	17.0	22.6	28.3	29.4	30.5	31.7	32.8	33.9	35.1	36.2	37.3	
25	11.4	17.1	22.9	28.6	29.7	30.9	32.0	33.1	34.3	35.4	36.6	37.7	

w
(in pounds)

$m = \frac{wp}{35}$

6.5 the value $F_2 = 5.89$. Then the fat percentage of the desired top milk "f" equals F_1-F_2.

$$\begin{array}{l} F_1 = 13.54 \\ F_2 = 5.89 \\ \hline f = 7.65 \text{ per cent. fat} \end{array}$$

From Table II. c we learn that milk of this fat percentage is obtained by dipping off and mixing the top 14 ounces of a milk of good quality contained in a commercial quart bottle after the cream has risen.

Example:—

$$\begin{array}{l} e = 60 \\ p = 3.2 \\ a = 2.6 \\ c = 7 \\ f = ? \\ \hline F_1 = 6.93 \\ F_2 = 5.69 \\ \hline f = 1.24 \text{ per cent. fat} \end{array}$$

From table II. c we learn that this milk is obtained by dipping off 7 top ounces and mixing the skimmed milk, which contains 1.25 per cent. fat.

Table III. consists of two sections—a and b. It leads to values L_1 and L_2, and shows by a simple subtraction how much sugar, expressed in ounces, must be added to the modified milk to give it the desired sugar percentage (l).

$$l = L_1 - L_2$$

The vertical column of Table III. a contains the total amount of modified milk for twenty-four hours' use, "t." The horizontal headline contains the desired sugar percentages, "c"—6.0, 6.5, 7.0. These two factors determine the minuend "L_1." The Table III. b contains two columns, one showing the amount of whole milk used for the preparation of the modified milk, the other the subtrahend "L_2."

Example: 15 ounces of whole milk have been diluted to 35 ounces of modified milk, the percentage of which in sugar shall be raised to 7 per cent. How much sugar must be added?

$$t = 35$$
$$c = 7$$
$$m = 15$$

$$L_1 = 2.45$$
$$L_2 = 0.75$$

$$l = 1.7 \text{ ounces of sugar}$$

TABLE II. A.

	1.0	1.5	2.0	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	p
60	22.56	15.04	11.28	9.02	8.68	8.35	8.05	7.78	7.52	7.28	6.93	6.84	
65	24.44	16.29	12.22	9.78	9.40	9.05	8.73	8.43	8.15	7.88	7.64	7.41	
70	26.32	17.55	13.16	10.53	10.12	9.75	9.40	9.08	8.77	8.49	8.22	7.98	
75	28.20	18.80	14.10	11.28	10.85	10.64	10.07	9.72	9.40	9.10	8.81	8.55	
80	30.08	20.05	15.04	12.03	11.57	11.14	10.74	10.37	10.03	9.70	9.40	9.12	
85	31.96	21.31	15.98	12.78	12.29	11.84	11.41	11.02	10.65	10.31	9.99	9.68	
90	33.84	22.56	16.92	13.54	13.02	12.53	12.09	11.67	11.28	10.92	10.58	10.25	
95	35.72	23.81	17.86	14.29	13.74	13.23	12.76	12.32	11.91	11.52	11.16	10.82	
100	37.60	25.06	18.80	15.04	14.46	13.92	13.43	12.96	12.53	12.25	11.75	11.39	
105	39.48	26.32	19.74	15.79	15.17	14.62	14.10	13.61	13.16	12.74	12.34	11.96	
110	41.36	27.57	20.68	16.54	15.96	15.32	14.77	14.26	13.78	13.34	12.92	12.53	
115	43.24	28.83	21.62	17.30	16.63	16.01	15.44	14.91	14.41	13.95	13.51	13.10	
120	45.12	30.08	22.56	18.05	17.35	16.71	16.11	15.56	15.04	14.55	14.10	13.67	
e													

$$F_1 = 0.376 \frac{e}{p}$$

TABLE II. B.

	6.0	6.5	7.0	c
0.5	20.02	21.56	23.10	
0.6	16.94	18.22	19.51	
0.7	14.74	15.84	16.94	
0.8	13.09	14.05	15.02	
0.9	11.81	12.66	13.52	
1.0	10.78	11.55	12.32	
1.1	9.94	10.64	11.34	
1.2	9.24	9.88	10.52	
1.3	8.65	9.24	9.83	
1.4	8.14	8.69	9.24	
1.5	7.70	8.21	8.73	
1.6	7.32	7.80	8.28	
1.7	6.97	7.43	7.88	
1.8	6.67	7.10	7.53	
1.9	6.40	6.81	7.21	
2.0	6.16	6.55	6.93	
2.1	5.94	6.30	6.67	
2.2	5.74	6.09	6.44	
2.3	5.56	5.89	6.23	
2.4	5.39	5.71	6.03	
2.5	5.24	5.54	5.85	
2.6	5.09	5.39	5.69	
2.7	4.96	5.25	5.53	
2.8	4.84	5.11	5.39	
2.9	4.73	4.99	5.26	
3.0	4.62	4.88	5.13	
3.1	4.52	4.82	5.02	
3.2	4.43	4.67	4.91	
3.3	4.34	4.57	4.81	
3.4	4.26	4.48	4.71	
3.5	4.18	4.35	4.62	

$$F_2 = 1.54\left(1 + \frac{c}{a}\right)$$

TABLE II. C.

Chapin's table on top milks, modified and extended for the use of bottom milk.

	FAT PERCENTAGES OF TOP MILKS.
1st ounce of top milk	25. per cent.
2 ounces top milk mixed	24. “ “
3 “ “ “ “	22.5 “ “
4 “ “ “ “	21.4 “ “
5 “ “ “ “	19.2 “ “
6 “ “ “ “	16.8 “ “
7 “ “ “ “	14.9 “ “
8 “ “ “ “	13.3 “ “
9 “ “ “ “	12. “ “
10 “ “ “ “	10.9 “ “
12 “ “ “ “	9.3 “ “
14 “ “ “ “	8.2 “ “
16 “ “ “ “	7.3 “ “
18 “ “ “ “	6.6 “ “
20 “ “ “ “	6.1 “ “
22 “ “ “ “	5.6 “ “
24 “ “ “ “	5.3 “ “
26 “ “ “ “	5. “ “
28 “ “ “ “	4.7 “ “
30 “ “ “ “	4.5 “ “
32 “ “ “ “	4.25 “ “

		FAT PERCENTAGES OF BOTTOM MILKS.
1 ounce top milk dipped off,	31 ounces bottom milk mixed	3.6 per cent.
2 ounces “ “ “ “	30 “ “ “ “	2.9 “ “
3 “ “ “ “ “	29 “ “ “ “	2.4 “ “
4 “ “ “ “ “	28 “ “ “ “	1.8 “ “
5 “ “ “ “ “	27 “ “ “ “	1.5 “ “
6 “ “ “ “ “	26 “ “ “ “	1.4 “ “
7 “ “ “ “ “	25 “ “ “ “	1.3 “ “
8 “ “ “ “ “	24 “ “ “ “	1.2 “ “
9 “ “ “ “ “	23 “ “ “ “	1.2 “ “
10 “ “ “ “ “	22 “ “ “ “	1.2 “ “
Skimmed milk		1.2 “ “

TABLE III. A.

	6.0	6.5	7.0	c
10	0.60	0.65	0.70	
11	0.66	0.72	0.77	
12	0.72	0.78	0.84	
13	0.78	0.85	0.91	
14	0.84	0.91	0.98	
15	0.90	0.98	1.05	
16	0.96	1.04	1.12	
17	1.02	1.11	1.19	
18	1.08	1.17	1.26	
19	1.14	1.24	1.33	
20	1.20	1.30	1.40	
21	1.26	1.37	1.47	
22	1.32	1.43	1.54	
23	1.38	1.50	1.61	
24	1.44	1.56	1.68	
25	1.50	1.63	1.75	
26	1.56	1.69	1.82	
27	1.62	1.76	1.89	
28	1.68	1.82	1.96	
29	1.74	1.89	2.03	
30	1.80	1.95	2.10	
31	1.86	2.02	2.17	
32	1.92	2.08	2.24	
33	1.98	2.15	2.31	
34	2.04	2.21	2.38	
35	2.10	2.28	2.45	
36	2.16	2.34	2.52	
37	2.22	2.41	2.59	
38	2.28	2.47	2.66	
39	2.34	2.54	2.73	
40	2.40	2.60	2.80	
t	$L_1 = \frac{tc}{100}$			

TABLE III. B.

m	
3	0.15
4	0.20
5	0.25
6	0.30
7	0.35
8	0.40
9	0.45
10	0.50
11	0.55
12	0.60
13	0.65
14	0.70
15	0.75
16	0.80
17	0.85
18	0.90
19	0.95
20	1.00
21	1.05
22	1.10
23	1.15
24	1.20
25	1.25
26	1.30
27	1.35
28	1.40
29	1.45
30	1.50
31	1.55
32	1.60
m	$L_2 = \frac{m}{20}$

THE DIAGNOSTIC VALUE OF THE CHEMICAL AND BACTERIOLOGICAL EXAMINATION OF CEREBROSPINAL FLUID.*

BY ALFRED HAND, JR., M.D.,
Philadelphia.

The exact diagnosis of the different forms of meningitis is always important. With the introduction of a specific treatment for one of the forms, which as Pepper used to say "maims for life when it does not kill, as does no other disease, save possibly scarlet fever," the importance is greatly increased of arriving at an exact diagnosis as early as possible. Thanks to Quincke, lumbar puncture furnishes the means of making an exact diagnosis. But the fluid obtained by lumbar puncture must always be examined with great care in order to arrive at a correct interpretation. There may be said to be two main types of cerebrospinal fluid, one in which the interpretation is easy and the other in which it is difficult. It is easy when the fluid is typical of one or another form of meningitis, but in the majority of cases it requires a painstaking, careful examination. Typical specimens present well-marked contrasts. Thus, if the fluid from a case of meningitis shows a milky opalescence, which disappears as the fibrin-network forms, leaving a clear fluid which contains a great increase in the normal amount of albumin and with the presence of sugar but little if any below the normal percentage, the fibrin network also being found to contain mainly mononuclear leukocytes and tubercle bacilli, the diagnosis is clearly tuberculous meningitis. If the fluid is distinctly turbid, with sometimes a slight yellowish tint, and polynuclear leukocytes are found in abundance some of them containing in their protoplasm diplococci, the diagnosis is established of epidemic cerebrospinal fever; after the fibrin network has formed and been withdrawn, further study of the fluid will show moderate increase in the albumin and total absence of sugar. A pneumococcic meningitis gives a very similar fluid, with occasionally a greenish-yellow tint, as in strepto- or staphylococcic meningitis, but the diplococcus in this form is hardly ever seen in the pus cells, being very abundant in the fluid. (In the two latest cases of pneumococcic meningitis which I have seen, the fluid from one secondary to an otitis had a few leukocytes which contained diplococci, while the majority of the germs were free in the fluid, and the fluid from the other, secondary to a small pneumonic focus, showed every polynuclear leukocyte surrounded by a complete ring of diplococci but none in the protoplasm). The fluid in this and other septic forms resembles that in the epidemic form in having a moderate increase in albumin and a total absence of sugar.

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* Read at the Twentieth Annual Meeting of the American Pediatric Society, May 25, 1908.

But the fluid obtained by lumbar puncture may not have these striking characteristics; it may be only slightly turbid or apparently perfectly clear, so that it is well to have a systematic method of examination. The first step of importance is to start the examination as soon after the fluid is obtained as possible. It is well to allow a drop to fall from the needle on to a slide; or shortly after collecting the fluid, a loopful is transferred to a slide, evaporated, and the film stained immediately. The meningococcus may then be found in great numbers in some cases, while an examination postponed over night may fail to show any germs whatever. Having taken this film and also cultures, which may also be made while the fluid is flowing from the needle, or soon after, the test tube containing the fluid is allowed to stand for several hours in order that the leukocytes and bacteria may sink and the fibrin-network form. Then with a straight platinum needle the network is carefully transferred to a slide, the best preparation being obtained by tilting the test tube so that the fibrin always floats in the fluid. It is then possible to spread out the network on the slide, evaporate the fluid and fix by heat. Before staining this preparation, it will save time to conduct a chemical examination of the fluid. Half of it may be used for a quantitative estimation of the albumin, and for this purpose the acetic acid and potassium ferrocyanid test in the graduated urine tubes and the centrifuge is convenient and seems to me to be reasonably accurate. At least, I have always found a fairly constant result for the different forms of meningitis. This test gives the bulk percentage of albumin, and every specimen of tuberculous meningitis I have examined has shown 5 per cent. or over, the usual amount being about 9 per cent. or 10 per cent. The other forms of meningitis have never exceeded 5 per cent. in my experience, the average being 3 per cent. or 4 per cent., the amount in normal fluid being one-half of 1 per cent.

The other half of the fluid should be used for the phenylhydrazin test for sugar; Fehling's solution may be used, but there is often not enough fluid to give a reaction, and the phenylhydrazin test is much more delicate.

The results of these two tests will serve as a guide for staining the slide previously prepared. If the albumin is above 5 per cent. by bulk and if sugar is present, then the staining should be for tubercle bacilli, with a mechanical stage used for the search, which will be rewarded with a positive result in something over 99 per cent. if the technic has been carefully followed.

If the albumin is below 5 per cent. and sugar is absent, it is hardly worth while to stain for tubercle bacilli, but the examination may then be devoted to a search for the meningococcus. It is sometimes impossible to decide whether a case is of the epidemic or pneumococcic variety, as the slide may show only a few isolated cocci, or even none at all.

I have thus far laid little stress on a differential count of the leukocytes; this is often of great value, when it can be made, but the cells are often distorted or degenerated and it is difficult in some cases to decide their true form.

The fact that the tuberculous form is associated with the persistence of sugar in the fluid and the almost total absence of polynuclear leukocytes, while the reverse holds for other infections led me to think that perhaps there was some relation between the two and that inasmuch as a proteolytic ferment has been obtained from degenerating leukocytes there might perhaps be also a sugar-splitting ferment. The experiments which I made are incomplete as yet, owing to a lack of coincidence of suitable material, but a preliminary report follows.

Pus from an empyema was used, giving no reduction of Fehling's solution.

One drop of pus from each c.c. was added to a 0.5 per cent. solution of glucose, giving a fluid of about the degree of turbidity of a pneumococcic meningitis, and the mixture was incubated for twenty-four hours at 37.5° C; at the end of that time the sugar was reduced exactly one-half, to 0.25 per cent.

Cultures of the pus on agar and blood-serum gave staphylococci. Another tube containing 0.5 per cent. glucose solution was inoculated with the germs and incubated for thirty-two hours, with an almost imperceptible lessening in the amount of sugar, the resulting calculation giving 0.49 per cent.

These results, if confirmed by subsequent tests, point to the existence of a sugar-splitting ferment in polynuclear leukocytes.

(Since writing the above, I have had an opportunity to use Flexner's antiserum in a case of meningococcic meningitis, the resulting changes in the characteristics of the fluid being extremely interesting. At the first tapping 45 c.c. of turbid fluid literally spouted from the needle; sugar was absent, albumin was increased to 5 per cent. by bulk, many leukocytes were present, staining very poorly with the outlines of the cells and nuclei very indistinct, a few of them containing diplococci. Injections of antiserum were given on the three days following, the fluid at the second and third tappings resembling that at the first, with 45 c.c. each time; at the fourth tapping, when the last dose of antiserum was given, only 15 c.c. were obtained, the albumin being slightly increased to 6 per cent., the leukocytes being well-preserved, polynuclears being in the majority but mononuclears being abundant, a few diplococci being found; and sugar was also present, probably an indication of a return to the normal condition of the fluid, as no further tappings were necessary, recovery being speedy).

THE TREATMENT OF INCONTINENCE OF URINE IN CHILDREN.—(*Gaz. Médicale de Paris,* January 5th, p. 3.) In the treatment of this condition, in addition to correcting hyperacidity of the urine, it is necessary that the patient should be systematically awakened in order to empty the bladder. This is most effectual when it can be done at the critical moment—just before micturition. In some cases satisfactory results may be obtained by laying the child on a pad containing two layers of metallic gauze separated by a dry cloth. Each sheet of gauze is connected by a wire with a loud electric bell placed beside the bed. The first few drops of urine are sufficient to complete the circuit and the sound of the bell wakes the sleeper and reflexly arrests the flow of urine. It is stated that from two to five such experiences suffice to secure spontaneous awakening on the onset of micturition.—*The Hospital.*

URINARY INFECTION.—A COMMON CAUSE OF FEVER IN INFANCY AND CHILDHOOD.*

BY M. J. LIPPE, M.D.,

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In recalling to memory a large number of cases of febrile disturbance in infancy and childhood, I see a number of cases that were a source of worry to me for the simple reason that the diagnosis was unsatisfactory. Some of these cases were called malaria, a number irregular typhoid, and a few tuberculosis. In the light of a more careful study of these cases of indefinite fever they become very definite and easily diagnosticated as primary urinary infections. They constitute a fairly large number of cases; in fact, the disease is fairly frequent and the surprising thing is that so little is said about it in current literature, and that text-books do not lay more stress on its importance and the ease of its recognition.

The disease is more common in infancy than in childhood and in the female than the male sex. Abt[1] reports a case in an infant of six weeks. The majority of my cases occurred in infants from nine to eighteen months old. The disease may simulate a number of diseases. Zahorsky[2] reports a case resembling typhoid fever and cites Hartwig as reporting 3 cases, which, in their clinical aspect, resembled typhoid. The constant symptoms are fever (frequently high; 106° in one of my cases), pallor, anorexia and disturbance of urination, which is usually frequent and often painful. Urination may be infrequent, the pain causing the child to hold the urine as long as possible. A chill is common in older children; it may occur periodically, every day or every other day, followed by fever and even pronounced sweating. Restlessness, particularly at night, is usual.

The disease has a tendency to get well spontaneously, but proper medication, etc., shortens its course. It may end fatally if the kidney itself becomes badly damaged. If not completely cured a recurrence of the high fever and other symptoms may come on with the onset of, or during, the course of any other disease.

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* Read before Bethesda Pediatric Society, March 27, 1907.

In the diagnosis, the main thing is to keep in mind the probability of a urinary infection being present in any case of febrile disturbance not accounted by infection of the respiratory or gastroenteric tract. Rheumatism must also be excluded. Malaria may be excluded by a blood examination, which shows the absence of the plasmodium and the presence of a leukocytosis.

Why it is more prevalent in baby girls, and why it occurs in well-cared for babies, and why the colon bacillus preponderates is not due to a mere contact of a large stool with the vulva, there is something more; observe the careful mother or nurse remove a soiled diaper and clean the parts. After folding the more soiled part of the napkin she wipes the buttocks first and finishes by making a wiping motion toward the urethra, which is easily infected on account of its anatomic situation. From the short urethra the infection spreads to the bladder and may extend up the urethra to the pelvis of the kidney, or even to the kidney itself. Heubner[3] believes this is the cause of most cases.

The urinalysis determines the diagnosis. The urine is turbid in most cases. In bladder infection it is usually turbid; in infection of the pelvis of the kidney it may be clear, if the bladder infection has subsided. The reaction is usually acid. The micro-organism most common is the colon bacillus; staphylococci and streptococci are causative in some cases. Other micro-organisms have been found by some observers. Albumin is present, ranging from a trace to a large percentage. The specific gravity varies from 1.008 to 1.015. Microscopic examination shows the presence of pus cells, red blood cells (in early examinations), bladder epithelia, kidney pelvis epithelia, bacteria, and where there is kidney involvement, casts.

The treatment is simple and satisfactory in most instances. Mothers should be warned not to rub soiled diapers against the urethra. Hexamethylenamin is curative in most cases, in doses of 5 to 15 grains daily. This drug is irritant to some kidneys. In cases of longer duration I have found the acetate of potash, with the infusion of digitalis of decided benefit. Hydrotherapy for the pyrexia, tonics for the anemia and laxatives, of course, are used as needed.

The following histories serve to illustrate some types of the disease:—

I. Esther L., fourteen months old, developed fever without apparent cause, had a slightly rigid nucha, no Kernig's sign, peculiar rolling of head, a to and fro movement; was irritable and cross, vomited several times without nausea, bowels constipated. Blood examination on fourth day revealed a leukocytosis; a urinalysis showed albumin, pus, bacteria, etc. Put on urotropin; recovery in ten days.

II. Baby G., healthy, fat girl, nine months old, temperature 105° on second day of illness when first seen, hurried breathing, expiratory moan, nothing made out in lungs, urinalysis revealed character of trouble which yielded to usual treatment.

III. Baby E., female, nine months old. History of grippe ten days ago and some digestive disturbance which had become better; temperature 105°; baby very pale and restless; nothing abnormal made out by physical examination. Examination of urine revealed pus, albumin, etc. This infant ran an irregular fever for several weeks, but eventually recovered.

IV. Baby M., thirteen months old, had slight cold for a week, few dry râles in chest. Mother developed a severe case of grippe about this time. The baby suddenly developed a temperature of 106°, with no exaggeration of respiratory signs except rapidity of breathing, accounted for by the high fever. Urinalysis settled the diagnosis at once; recovery in three weeks, although the temperature was 106° for several evenings.

V. Rosa G., girl, nine months old, just returned from Mississippi; had had chills and fever for three months, which physicians had called malaria, but quinin had no effect in stopping chills or fever. When I first saw her she was having chills, followed by fever, every other day; was pale, and was said to have lost considerable weight. Blood examination: Widal negative, leukocytosis, no plasmodium, temperature raised from 100° on good days to $104^{6}/_{10}°$ on bad days. Urinalysis: Albumin, pus, etc. Urotropin had no effect. Acetate of potash, 6 grains, with 1 dram of freshly made infusion of digitalis every four hours, stopped the chills and fever; urine became clear in about three weeks.

VI. Howard F., seventeen months old, had been having fever and losing weight for a month before coming under my care; was irritable, sighed a good deal, and cried out in his sleep. A sister of this child died at the age of two years of tuberculous meningitis. The mother recalling the early symptoms of this case, of course, was duly alarmed. Physical examination negative. History of frequent wetting of napkins led me to get a specimen of urine which solved the riddle. Recovery under hexamethylenamin.

From my study of the cases cited, and many others, I believe the following conclusions are justified:—

(1) In any acute febrile disturbance in infancy not accounted for by gastroenteric or respiratory infection (particularly in a female) suspect urinary infection; examine both chemically and microscopically.

(2) Atypical fever cases may prove typical by making an urinalysis.

(3) In case of high temperature, if physical signs of pneumonia do not develop, look to the urine for a diagnosis.

(4) Enuresis may mean cystitis or cystopyelitis.

(5) Chills and fever with negative findings as to malaria, in the presence of a leukocytosis calls for an examination of the urine.

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1. Abt. The Journal of the American Medical Association, December, 1907.
2. Zahorsky. Courier of Medicine, August, 1907.
3. Heubner. Lehrbuch der Kinderheilkunde.

A DIPHTHERIA "CARRIER."—T. Strain (*The Lancet,* October 17, 1908) reports the case of a girl nursemaid who went through a severe attack of diphtheria and discharged from hospital with a free record as to absence of bacilli in the throat. After she had resumed the care of children, one of the latter contracted diphtheria. A culture from the maid's throat now showed the Klebs-Löeffler bacillus. She was isolated and again declared free. Still again one of her charges, this time in another family, became ill. The maid was readmitted to hospital and subjected to steady treatment with antiseptic sprays, scrubbing, etc. She remained in hospital for six weeks, by which time the throat was free, but the nose still harbored the bacilli, yet only intermittently, from which it was conjectured that they might come from one of the accessory sinuses which previously discharged its contents into the nares. It was nine months before the air passages were bacilli free.—*Medical Record.*

CLINICAL MEMORANDA.

CASE OF ULCERATIVE ENDOCARDITIS, WITH NECROPSY. CASE REPORT.

BY KAUFMAN SCHLIVEK, B.S., M.D.,
New York.

L. A. (female), age three years.

Family History.—Negative. Parents alive and well.

Previous History.—Measles two months ago; uneventful course, but since then child has been peevish and fretful. Several weeks ago she had an itching skin disease.

Present Illness.—Began two weeks ago with cough and fever. Temperature varied between 103° and 105°. During this time child has had frequent sweats and temperature assumed an intermittent type. Child complained of inability to stand or walk; whether this was due to weakness or to pain mother is unable to say. She cried out at night several times. Appetite is poor. Bowels normal during first week, but for past week three or four movements a day. Urination normal. On admission, temperature 103.6°, pulse 134, respiration 60.

Physical Examination.—General condition fair, fairly nourished, is pale and eyelids are edematous. She looks sick, is very restless and cries a good deal. Breathes rapidly and is somewhat cyanosed, especially about the lips. Perspires freely. Child lies on right side, legs flexed on thighs and thighs on abdomen. Sensorium is clear. Eyes, ears, nose normal. Neck, no rigidity. Tongue coated and dry. Throat red. Slight general discrete enlargement of the lymph nodes.

Lungs.—Few moist râles in both lungs, anteriorly and posteriorly. Good expansion at bases.

Heart.—Apex beat in fifth space just below the nipple. Upper Border third rib. Right Border midsternal line. Left Border mammary line. Action rapid, regular, fair force. No murmurs, second pulmonic is accentuated

Pulse equal, rapid, regular, low tension.

Abdomen slightly distended, held very tense, generally tympanitic, palpation unsatisfactory, no tenderness.

Liver dullness, fifth space; flatness, sixth space to free border of ribs. It is indistinctly palpable three fingers below free border of ribs.

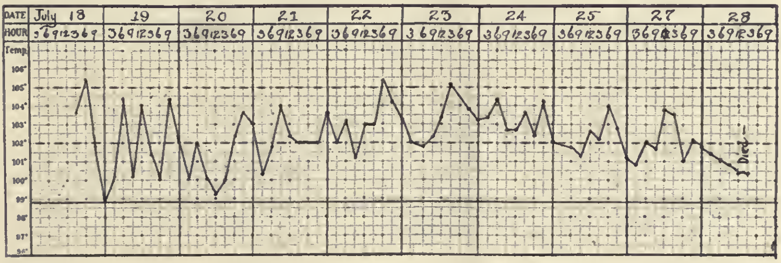
Spleen is indistinctly palpable two fingers below free border of ribs.

Extremities.—Fingers and toes cyanosed and cold. Right knee-jerk present. No Kernig. No Babinski. Left knee is tender; extension is painful and resisted; no other signs of inflammation. Genitals and rectal examination negative.

Blood Examination.—White blood corpuscles, 27,000. Differential count: Polynuclear neutrophiles, 67 per cent.; lymphocites, 23 per cent.

Urine amber, clear, acid. Albumin, trace. Sugar, none. Few hyalin casts and pus cells.

July 20th. The tenderness of left knee persists; most marked at inner side, lower end of femur. Patient refuses nourishment. Temperature is intermittent, 98.6° to 105.4°. Otherwise signs are unchanged.



Several diagnoses were then made. Bronchopneumonia, malaria, typhoid, rheumatism and sepsis.

Bronchopneumonia could not be excluded; the rapid respiration, cyanosis and temperature might all correspond to a pneumonia of severe grade, although the physical signs were not sufficient.

Malaria was excluded, for no plasmodia were found and leukocyte count was too high.

Typhoid was excluded, for Ehrlich and Widal were negative and leukocyte count was too high.

Rheumatism. The affection was too overwhelming and the pain was monarticular; but still this diagnosis was possible.

Sepsis was a very plausible diagnosis.

July 22d. General condition is not so good. Child is very quiet, not apathetic. She is very thirsty. Has profuse sweats, no chills. Temperature this afternoon is 105°. There are few petechiæ in conjunctival mucous membrane, upper and lower lids. Breathing is not so rapid, cyanosis less marked. Few more râles in both lungs. First sound at apex is rough. Liver is felt distinctly three fingers below free border of ribs. Spleen, two fingers below free border. The tenderness of left knee is less marked.

July 23d. More petechiæ all over body.

Blood culture was taken by Dr. J. J. Hertz. He obtained 6 c.c. of blood from superficial vein of forearm. Plated in agar, agar and ascitic serum, glucose agar, glucose agar and ascitic serum. Each plate contained 1½ c.c. of blood.

July 24th. There was a growth on the several media, probably staphylococcus pyogenes aureus. The diagnosis of sepsis now was certain.

July 25th. General condition is worse. Yesterday and today new crops of petechiæ appeared all over the body. The roughness of first sound at apex persists. Child has profuse sweats. The tenderness of left knee is unchanged. Liver and spleen unchanged.

July 26th. Dr. Hertz reported staphylococcus pyogenes aureus in the blood—35 colonies per c.c. We decided to prepare a vaccine from the organism found in the patient's blood and to inoculate her.

July 27th. General condition is very poor, child takes no nourishment, breathes rapidly, is very restless and cyanosed. Many moist râles in both lungs; expansion at bases is poor. Heart borders unchanged. First sound at apex is replaced by a short, squeaking, musical murmur; it is heard over entire precordium and for a short distance toward the axilla. This made the diagnosis septic endocarditis.

Later in the day the murmur became faintly audible, child developed pulmonary edema and ceased to breathe at 7 P.M.

Treatment.—Stimulation and salicylates for few days.

NECROPSY.—*Heart* not enlarged. On the mitral valve is a pedunculated verrucose vegetation about the size of a large green pea; it is on the upper part of the anterior flap. There are two small ulcerations on this vegetation. On either side of this large vegetation is a small flat one.

Lungs.—Congestion and edema.

Liver.—Enlarged, congested and fatty degeneration.

Kidneys.—About normal size, capsule not adherent, congestion.

Spleen.—Enlarged, congested, numerous small grayish infarcts.

Staphylococcus pyogenes aureus was cultivated from the spleen.

My reasons for reporting this case are (1) the rarity of this condition in children and (2) because it shows the difficulty in diagnosis and, therefore, prognosis.

Osler found but 3 cases under ten years of age in his collection of 209 cases of malignant endocarditis. S. S. Adams reviewed the literature of about fifty years and found but 47 cases under fourteen years of age.

Septic endocarditis is generally divided into four groups based on the prevalence of certain symptoms: (1) Septic or pyemic; (2) typhoid; (3) cerebral, and (4) cardiac. This case is very typical of the first class.

LUMBAR PUNCTURE IN MENINGEAL FORMS OF TYPHOID FEVER IN THE CHILD, AND ITS THERAPEUTIC VALUE.—Ch. Reca and Firmin Carles (*Gazette Hebdomadaire des Sciences Médicales,* January 26, 1908) describe the different forms in which meningeal infection in the course of typhoid is found in children. The examination of the cerebrospinal liquid after removal by lumbar puncture is of value in diagnosis and prognosis. The fluid may be found to contain pus mixed with typhoid and other bacilli. It may be clear and still contain these germs. In these two cases there is a direct infection of the meninges by the bacilli of Eberth. Again there may be removed a clear fluid containing an abnormal number of lymphocytes. Here the toxins of the bacilli are irritating the meninges. Lastly, the fluid may be of normal composition and underhypertension. Here the same condition increases the tension. The value of the procedure consists in the abstraction of toxins and bacilli when they are present by repeated punctures, and the relief of tension and of pressure on the nerve centers.—*Medical Record.*

A CASE OF CONGENITAL OBSTRUCTION OF THE URETHRA.*

BY JOHN SPEESE, M.D.,
Assistant Instructor in Surgery, University of Pennsylvania, Philadelphia.

The following case presents an anomaly of such rarity and associated with consequences of so fatal a character that it is deemed of sufficient interest to record.

The child was born dead. Syphilis was assigned as a possible cause of death on account of the history of repeated miscarriages. On opening the abdomen both kidneys were seen to be enormously distended. The left organ was fully the size of a large orange, and the right one somewhat smaller. Both ureters were distended, measuring about 2 cm. in diameter. They could be traced in a tortuous course to the bladder, which also was distended and projected into the abdominal cavity. It was at once seen that an obstruction to the outflow of urine existed somewhere in the course of the urethra, and at first a greatly elongated and adherent prepuce was thought to be the cause.

The prepuce was edematous, a condition secondary to balanoposthitis, but on splitting it and exposing the meatus an obstruction to the orifice could not be demonstrated. It was still possible, however, to suppose that an actual obstruction could have been caused by the condition of the glans and its adherent covering. In order to examine the urethra the canal was split through its entire length, when the prostatic portion was found to be dilated. Appearing directly in front of the veramontanum, a fold, or valve-like band resembling thickened mucous membrane was found. This was sufficient to obstruct completely and effectually the urinary stream. The normal appearance of the anterior urethra, and the pouch-like prostatic portion pointed conclusively to the valve as the actual obstruction, the preputial condition being regarded as an actual association, although its presence was considered as an interesting coincidence. The cause of death in this embryo, which presented the appearance of a child at full term, was due of course to the urinary obstruction. Normal kidney tissue was completely absent, the organ being transformed by pressure atrophy into a thin walled sac.

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* Read before The Philadelphia Pediatric Society, December 8, 1908.

Congenital strictures of the urethra and ureter are conditions which afford much interest because of the difficulty in explaining their occurrence. Instances are on record in which unilateral hydronephrosis has been caused by ureteral strictures or valves. Cases have been reported in which the external meatus is closed by a thin membrane which bulges from the pressure of the retained urine. The case observed could not be of this variety because the anterior urethra was normal. Congenital strictures may be found in any portion of the urethra, and most commonly near the external orifice. Guyon (v. Bergemann's System) distinguished two varieties of stricture in the pars cavernosa, the cylindrical and the valvular. The latter variety, which corresponds to my case, is described as a rare condition. These membranous valves may occur in any portion of the urethra and may interfere with the flow of urine.

Two cases are quoted in v. Bergemann's System, in each of which there was a valvular closure in the region of the prostatic portion of the urethra, with dilatation of the bladder, ureters and renal pelves. In obstructive lesions of this character, the secondary effect will usually be of such a severe nature that death of the embryo will ensue. If the symptoms of urinary obstruction are present at birth, catheterization should be performed with the hope of rupturing the valve and thus relieve the obstruction.

328 South 16th Street.

Absorption of Ointments.—*Sutton* (*British Medical Journal,* May 27, 1908), to determine the absorption time of certain ointment bases, incorporated in them aniline dyes and examined portions of the excised skin treated by the ointment thus prepared. The time the application had remained on and the depth of the stain was taken as an index of the rapidity of absorption. His conclusions were: Lard, simple or benzoated, and pure goose grease are the most quickly absorbed. Petrolatum, unless applied with friction, is poorly absorbed. Lanolin, alone, is slowly absorbed, but mixed with a more fluid oil, as olive, is readily absorbed. The addition of a small amount of cedar-wood oil considerably increases the rapidity of absorption of an ointment.—*Ohio State Medical Journal.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Abstract of Report of Stated Meeting, Held November 12, 1908.

DR. GODFREY R. PISEK IN THE CHAIR.

MORO CUTANEOUS TUBERCULIN REACTION.

DR. HENRY E. HALE presented a boy of four years to show the Moro tuberculin reaction. Two days before presentation he had received inunctions of a 50 per cent. Koch tuberculin (old) in anhydrous lanolin on one side of the chest and of a 50 per cent. Rockefeller Institute tuberculin on the other. The reaction was a beautiful one.

The method of application is as follows: The skin being thoroughly cleansed with alcohol, an amount of the ointment about the size of a pea is rubbed in for at least thirty seconds.

The reaction consists in the appearance of one or many red papules on more or less reddened bases. Some of these at times seem to contain fluid. The reaction is very often not confined to the immediate area of application.

DR. HERMAN SCHWARZ said that Moro had recently reported that the use of the tuberculin salve on one side of the body was followed at times by a reaction symmetrically placed upon the other half of the body. He ascribed this as due to a reflex angioneurotic condition.

DR. GODFREY R. PISEK said he had observed that in children with a history of diphtheria and in whom the use of antitoxin had been followed by an urticarial rash, the Moro reaction appeared more quickly and intensely. These children probably were more liable to dermatoses in general.

It had been his own experience that the Calmette eye test or the von Pirquet reaction could sometimes be obtained in suspected cases in which the Moro reaction was not obtained. But in those cases that gave histories of some previous skin affection a very quick, intense reaction was obtained from the Moro test in tuberculous children.

A CASE OF SPINA BIFIDA.

Dr. Sara Welt-Kakels presented a case of spina bifida in a girl of three and a half months. The child had a tumor in the sacral region about the size of an orange and covered with healthy skin. There was no paralysis of the extremities and no other deformities, but there was paralysis of the sphincters of the bladder and the rectum. There was no history of syphilis, but there had been four miscarriages in nine pregnancies. Dr. Welt-Kakels said the prognosis in these cases was bad.

Dr. William P. Northrup spoke of a similar case under his charge which was to be operated upon. In this case there was double club foot. Dr. Northrup recalled a case where there was hair lip, double club foot and a complete spina bifida.

Dr. Sara Welt-Kakels reported the subsequent history of a case of spina bifida with incontinence of bladder and anus whom she had presented some years before. Following an examination of the bladder for stone, the child developed temperature and a pus kidney, which was removed. The child improved for a while, but finally died under uremic symptoms.

A CASE OF OBSTINATE VOMITING.

Dr. William P. Northrup reported the case of an infant whose vomiting was cured by posture. The child was a first child; the mother had an abundant supply of milk which the child always vomited after nursing, although he would retain it from a bottle or when he nursed through a shield. The problem was finally solved by placing the child in such a position that his head was lower than his stomach and he had to nurse uphill. The mother afterward held the child over her shoulder with his head down with entire success.

This case was discussed by Drs. Thomas S. Southworth, W. B. Hoag, Herman Schwarz and J. Finley Bell.

A CASE OF ULCERATIVE ENDOCARDITIS WITH NECROPSY AND BLOOD FINDINGS.

Dr. Kaufman Schlivek presented this communication. (For article in full see page 54.)

Dr. William P. Northrup said that he knew of but one case of this kind. In that specimen wherever the walls of the heart had been whipped by the mitral valve was found an ulceration, with characteristic granulations and fibrin. This report of case with specimen had already been presented to the Pathological Society.

Dr. Herman Schwarz said that at the Mt. Sinai Hospital during the past six years there appeared two such cases, one a child of seven years, the other a child of ten years of age. He called attention to the fact that the changes occurred more frequently in the pericardium, less frequently in the endocardium.

Dr. Sidney V. Haas recalled a case of ulcerative endocarditis occurring in a boy of seven or eight years of age, who was a victim of urethritis. He had pus in both kidneys, an abscess in the prostate gland and a gonorrheal endocarditis. The case gave a pure culture of the gonococcus.

TICS IN CHILDREN AND THEIR TREATMENT.

Dr. E. W. Scripture read this paper. (See page 10.)

The reading of the paper was illustrated by the presence of several patients with tics, some of whom showed remarkable results from the treatment outlined in the paper.

Dr. Scripture also showed several stutterers who were in the process of cure by means of being trained to sing and to talk in a melodious fashion.

Dr. Charles Herrman said there was no adequate provision made for the treatment of stammerers and stutterers, whereas there should be in every clinic some department for the special care of these cases. They fell now, as a rule, into the hands of the non-medical practitioners. He was glad that Dr. Scripture had brought out so forcefully the association of stammering and stuttering with tics. In his experience, there was a decided association between the two conditions. Not enough attention was paid to tics, possibly because tics were not serious enough to compel the parent to take the children to the physician.

One tic he thought it very important that they should recognize was mental torticollis. This was an example of the tonic as contrasted to the clonic tic. Many of these cases were operated on unnecessarily. Many cases were cured without operation by the methods Dr. Scripture had referred to.

Many children with tics had trouble with the eyes or nose;

there might be found errors of refraction, adenoids or other conditions; however, one should be cautious in promising to cure tics by an operation on the eyes or the nose.

Tics must remain a long time under treatment, as there is a tendency to recur; although they may permanently be cured, they should remain under observation for years.

Dr. La Fétra said that during the past two years he had seen many of these cases at the Vanderbilt Clinic and had sent them to Dr. Scripture's class in the same institution. The results obtained were most gratifying. Many of these cases were mistaken for chorea, but he believed that if the distinction was kept in mind between the types of movements, more of these patients would receive proper treatment than had heretofore.

Dr. B. Onuf said athetosis and other involuntary movements resulting from cerebral birth palsies, or infantile cerebral palsies might be mistaken for tics, particularly spasm of the neck and shoulders. The presence of a foreign body always produced reflex spasm, but at the same time voluntary movements, having the purpose of removing the foreign body or of what gives the feeling of a foreign body. If the source of irritation continued, these voluntary movements became involuntary, being amalgamated, so to speak, with the reflex movement and, having become so automatized, they continued even after the source of irritation is removed. The therapeutic task, therefore, consists, as Dr. Scripture had pointed out, in transforming them again into voluntary movements and thus getting them under control.

He called attention also to those cases in which a mental tic was connected with the physical tic, that is, the patient while talking may, for instance, jump away from the topic of conversation and comment on some object within his range of vision or he may burst forth with some peculiar remark as, for instance, giving the age of a person in inches. In such cases it is very important to subject the patient to a system of education. He must be taught to control his actions and his will, and sometimes it is indispensable that he should be removed from his surroundings.

Dr. Charles E. Atwood said that in both stuttering and tics there was a danger of relapses, and it was always advisable to treat the patient as well as the disorder. In some cases hydrotherapy was useful; in some electricity might be employed to advantage, applying the galvanic or the Leduc current to the affected muscles and faradism to the opposing muscles. A resort to surgery should be most exceptional.

Dr. Louis C. Ager asked if there were any real grounds for supposing that this method of introducing cadence and rhythm into the voice changes in any way the reflex cerebral arc, or whether it was simply a form of self-hypnosis.

Dr. Herman Schwarz asked if there was a distinct difference between stuttering and stammering. He also asked if there was noticed an asymmetrical condition of the face.

Dr. Henry Heiman said it was very difficult to differentiate tics from chorea. One of the methods used was to have the child protrude its tongue; for in chorea one of the first symptoms was choreic movements of the tongue. Another method was to have the patient's hand held by the physician and the patient look into the physician's eyes; this would check inhibition to a certain extent and produce excitation. Tics disappeared during sleep; so also do even the most severe forms of the choreic movements.

Dr. Jenkins said that one could tell whether or not the eyes were involved by placing a bandage over them and thus excluding the light. Many cases of spasm might be entirely overcome by correcting an existing astigmatism or a hypermetropia.

Dr. Godfrey R. Pisek said he had treated the first case presented by Dr. Scripture for a marked chorea, and he had cleared up under the ordinary methods of treatment. An ocular defect had been corrected, and finally, the tic alone remained. It was astonishing to note the change in this case under the care of Dr. Scripture for a few days only.

Dr. E. W. Scripture, closing the discussion, said that there were various methods of detecting chorea, and the one employed of sticking the tongue out and noting the choreic movements was familiar to all of them. He had never thought of employing for choreic movements the same method as in correcting tics. Chorea was due to an infection, and these methods of using a mirror, etc., rested on an entirely different theory. He did not see how it could work.

Bad cases of stuttering were met with in people of fifty years of age and over that were curable. Bad cases were met with also in the young; they were very difficult to cure when there was a defective will power. Anywhere from one-third to one-half the stutterers could be cured by the general practitioner if they would devote a little attention to the methods required. One per cent. of the entire population stuttered. There was no essential difference between stuttering and stammering; in stuttering the same syllable was repeated over and over again; in stammering there were general cramps. In cases of complicated tics the patients may be taught to move gracefully and to assume graceful attitudes; this gets them out of the habit of having convulsive and irregular movements.

PERIODIC ACETONEMIA IN OLDER CHILDREN. — Hecker (*Münchener Medizinische Wochenschrift,* July 14, 1908) says that recurrent vomiting accompanying the increased acetone-content of the blood is a typical picture in the diseases of children caused by disturbances in the excretion of acetone bodies. Boys are usually affected; the attacks of vomiting occur periodically; the vomitus contains at first half-digested food, then becomes mucus in character, and may be tinged with bile or blood; no dietetic or medicinal treatment avails to stop the attack; great loss of strength and weight occurs in a very short time, and the patients suffer from intense thirst, not being able to retain anything in the stomach. The attack lasts two or three days and complete convalescence is followed by a recurrence which runs the same typical course. During the attacks the breath has the sweet, fruity odor of acetone, the urine contains the same body in abundance as well as diacetic and oxybutyric acids, which all disappear with the cessation of the vomiting. Hecker reports 6 cases of the diseases observed by him and expresses his conviction that the vomiting is a secondary symptom caused by the acetonemia and not *vice versa.* The therapy of the condition is not satisfactory. In some cases where the nervous element is present, suggestion is in place. Dry diet, with the use of chocolate and white bread may be used during the attack. The administration of alkalies proved to be of especial value, sodium bicarbonate or Karlsbad water being used. Systematic dietetic and hygienic treatment is called for between the attacks.—*Medical Record.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

Abstract of Record of Meeting, December 8, 1908.

J. P. Crozer Griffith, M.D., President.

SPORADIC CRETINISM.

Dr. S. A. S. Metheny showed one case and reported another. The first was a girl, fourteen months of age, in whom marked improvement had followed thyroid treatment, the child having gained two pounds in the last two weeks, while one incisor was coming through. The second case was a boy of fourteen months, in whom the improvement was even more marked.

Dr. A. H. Davisson said that in one of his cases of cretinism, in which improvement had only progressed to a certain point, Dr. Fussell, who examined the child with him, considered that there was an element of mental deficiency that explained the failure to obtain complete recovery. Dr. Davisson added that he had never seen complete recovery follow the use of thyroid extract.

Dr. John Speese said that the transplantation of thyroid tissue had been followed by excellent results in the treatment of cretinism. This method is indicated especially when the drug administered by mouth caused gastrointestinal derangement. Dr. Speese mentioned the investigations which are being made in the transplantation of thyroid tissue into the spleen and the epiphyseal end of bones.

Dr. J. T. Rugh cited another case, seemingly an idiot, who has shown the most remarkable improvement upon thyroid extract, and gave promise of practically normal development.

Dr. D. J. M. Miller said that the earlier the treatment the greater were the chances of permanent cure; and, as cases have recovered after years of treatment, it was important to continue treatment for a long time; cases have been reported showing complete recovery after ten years of treatment.

Dr. S. McC. Hamill said that in only one case had he seen the thyroid treatment carried out conscientiously through a period of years. In this instance the child was under practically constant treatment for a period of five years. During the first few months improvement was marked; then less satisfactory up to the time that the patient passed from observation. Treatment was begun when the child was four or five years old, when he had not developed at all mentally, and was able to say only a few words, which were difficult to understand. At the end of a year he could talk quite distinctly and connectedly, and was far enough advanced to be sent to school, where he progressed fairly well. On several occasions during the course of treatment, sometimes from the mother's inability to procure thyroid extract or from her desire to stop the treatment, the youngster went without the drug for some weeks. At the end of this time marked retrograde changes had occurred. It was never possible to give the remedy in as full doses as was desired, because any increase beyond a grain three times a day resulted in digestive disturbances. Dr. Hamill felt inclined to recommend the treatment by thyroid transplantation, which had been referred to by Dr. Speese.

SARCOMA OF THE NASOPHARYNX.

Dr. I. H. Jones showed a boy, fourteen years old, the left side of whose nose had always had some obstruction. At the age of five years it was noticed that the left side of the nose was more prominent than the right. In June, 1907, the left naris began to bleed. In September a polypoid growth was removed from well back in the nasal passage. In two weeks the growth had returned, and in three weeks an attempt to remove it was prevented by excessive hemorrhage. Two weeks later most, but not all, of the growth was removed, whereupon it again grew to a much larger size. In January, 1908, a mass the size of a walnut was removed from the left naris. Though the main part of the growth was in the left naris, the tumor was attached to the vault of the pharynx on the right side. On account of the bleeding, two large pieces were removed in March; and in July a mass the size of a walnut was taken from the pharynx. By October the entire pharynx was filled, the mass extending down to the base of the tongue. Part of the growth in the naris was snared off in October by Dr. Kyle. In November Drs. Stout and Wharton removed the mass through the mouth and nose. The boy was in fairly good condition, except for great anemia, and an almost certain prospect of a rapid return of the tumor.

Dr. G. C. Stout said that the relief following operation was marked; but the anemia resulting was very great.

Dr. L. J. Hammond has within the past week seen a case of sarcoma in a girl of eleven years that was somewhat analogous to the one just presented, the malignancy being first discovered two years ago in the submaxillary gland on the left side. After the removal of this gland the condition remained quiescent for eighteen months. The clinical picture at present showed extensive swelling over the entire left side of the jaw and cheek, the malignant mass protruding into the fauces and mouth, interfering with breathing and preventing mastication, as the mouth was held in a gaping position. Metastasis had already occurred in the spinal cord about the tenth dorsal vertebra, producing total paralysis in the legs and the organs supplied by the nerves below this point.

THE CORRECTION OF ROTARY LATERAL CURVATURE.

Dr. W. G. Elmer showed a girl of twelve years to illustrate some remarks on the application of force in the correction of rotary lateral curvature. (A paper on this subject, by Dr. Elmer, will appear in the February Archives.)

Dr. T. A. O'Hara said that he considered this method a great improvement over the old suspension method.

Dr. Rugh said that the greatest success achieved was by the combined method of treatment, a fixed form of support being used along with developmental exercises. The earlier in the course of the deformity treatment was begun the better were the results, and fixation and exercises must be carried out until the patient was more than cured.

Dr. R. Tait McKenzie said that he also advised the use of suspension, together with lateral pressure. Gymnastic exercises should be continued until after all deformity has disappeared. The patient should report for several years at intervals after active treatment has ceased.

CONGENITAL HEART DISEASE.

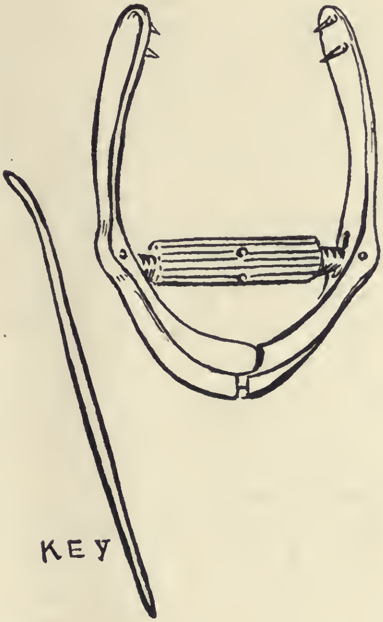
After reviewing the causes of congenital heart disease, Dr. W. N. Bradley reported the case of a boy six weeks of age, with great cyanosis, who died of bronchopneumonia soon after coming under observation. Autopsy showed small ventricles with a greatly dilated right auricle; foramen ovale large and patulous; the orifice of the pulmonary artery practically occluded. Branching off from the thick, dilated pulmonary artery was an anomalous vessel, replacing the ductus arteriosus, emptying into the under surface of the arch of the aorta.

CONGENITAL OBSTRUCTION OF THE URETHRA.

Dr. John Speese reported this case. (See page 58.) Discussed by Dr. Miller and Dr. Davisson.

CONGENITAL CLEFT PALATE.

Dr. L. J. Hammond exhibited a new instrument for approximating the palatine processes in cases of congenital cleft palate, consisting of two lateral plates, semi-oval, to conform to the shape of the lateral halves of the superior maxillary bone, and fastened together in front by a hinge in order to prevent any play of the lateral half while being introduced. They are brought together by a central right and left screw, which is so arranged as to bring together or separate the two lateral plates simultaneously. Sufficient force can be employed by this screw to bring together the palatine processes in any case where ossification is not a factor; and where it has advanced so far as to prevent it, an increased pressure kept up by tightening the screw will in a short time secure the same result. The fingers alone may be used to tighten the screw, or when in position the key which accompanies it can best be employed for this purpose. The two teeth which were set posteriorly along the inner and upper edge of each lateral plate were of two-fold value, keeping in position by their fixedness in the bony alveolus, and lessening the injury to the spongy alveolar



tissue throughout its entire surface, over which the lateral plates were applied.

Dr. Hammond said that he had used this instrument upon a child but two days old, now three months old, and throughout this period the nutrition and development had been quite in keeping with that of a normal child. He did not believe that the suffering from the instrument amounts to more than a dull ache and this was confined posteriorly at the point where the teeth of the instrument are anchored.

GERMICIDAL PROPERTIES OF MILK.—Rosenau and McCoy (*Journal of Medical Research,* March, 1908) report on a very extensive investigation of the germicidal properties of milk. Judged by the number of colonies that develop upon agar plates, the bacteria in milk first diminish and then increase in number. This so-called germicidal property of milk occurs only in the fresh raw milk. For the most part there is no actual reduction in the number of bacteria, but as compared with the controls a restraining action is evident. The action is that of a weak antiseptic rather than a germicide. When the milk is kept warm (37°C.) the decrease is pronounced within the first eight hours. After this time no restraining action is manifest. When the milk is kept cool (15°C.) the decrease is less marked, but more prolonged. The decrease in the number of bacteria is largely apparent, being due at least in part to agglutination. Phagocytosis plays no essential part in the germicidal action of milk. This action of milk is specific against certain bacteria. Dilution experiments demonstrate the enfeeblement of agglutins rather than the presence of a germicidal substance in solution. The germicidal actions of blood and milk resemble each other in some particulars, although blood serum acts much more quickly and more powerfully than milk. Freezing milk and then thawing it does not affect the phenomenon, while boiling it or heating it above 80°C. destroys its germicidal properties. The effect of lesser degrees of heat varies with the micro-organism. The germicidal action of milk varies with different animals, and with the same animal at different times. At most the action is variable and feeble. It cannot take the place of cleanliness and ice, but may be taken advantage of in good dairy methods.—*Boston Medical and Surgical Journal.*

CURRENT LITERATURE.

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Abstracts in this Number by
Dr. Henry Heiman. Dr. G. R. Pisek.
Dr. Alfred F. Hess. Dr. S. W. Thurber.

PATHOLOGY.

Shaw, H. L. K.: The Present Status of the Transmissibility of Bovine Tuberculosis. (*The Journal of the American Medical Association,* October 12, 1907, p. 1,276.)

Shaw summarizes his articles by saying that authorities we all respect are at variance over this issue. Clinical evidence has been, in the main, negative. The literature is so voluminous and contradictory that it is impossible to make any definite declaration of the present status of the transmissibility of bovine tuberculosis. That tuberculous cattle are a menace to public health, and give the disease through their milk in rare instances, has been proved. Efforts to stamp out the disease in cattle should be made, but the attention of the public should not be diverted from the great and very real danger of human contagion. Whether this takes place through the respiratory or digestive tract is immaterial. G. R. Pisek.

Blegvad, N. R.: Black Hairy Tongue. (*Annals of Otology, Rhinology and Laryngology,* September, 1908, p. 753.)

On account of the obscurity of the etiology and pathogenesis of this disease, it has received many names. There are, however, two characteristics, *i.e.,* hypertrophy of the papillæ and dark color. The papillæ have hairs varying in length from one-quarter to one-half an inch. directed from behind forward and situated near the base of the tongue. Symptoms are few and the condition may be discovered by accident, having not been noticed by the patient. Sometimes there is a sensation of dryness, paresthesia and some loss of taste. The condition may last but a few days or it may extend over many months. In 138 cases reported in literature, 12 were in children below fifteen years old. It occurs twice in man to once in the opposite sex, and this is due, according to the author, to the use of tobacco. The principal theories as to its etiology are: (1) Due to black mould which grows on the surface of the tongue; (2) Micro-organisms first produce hypertrophy of the papillæ and then the black color; (3) Hypertrophy due to organisms, but the color not; (4) Color due to organisms but the hypertrophy not. The parasitic theory has not been proven by either cultivation, inoculation or infection. The theory of keratinization and pigmentation of the epithelial cells of the papillæ filiformis has also not been proven to the author's satisfaction, so that, in his opinion, the disease originates in those persons with normally well-developed papillæ filiformis which have become prolonged and subjected to staining and irritation such as smoking, the use of mercury, mouth breathing and affections of the nose, mouth, throat and intestinal tract.

The remedy suggested is peroxide of hydrogen applied once or twice daily. This destroys the coloring matter. For the stomatitis which is nearly always present, some mild antiseptic mouth wash is indicated. S. W. THURBER.

CLARK, J. PAYSON: PAPILLOMA OF THE LARYNX IN CHILDREN; A FURTHER CONSIDERATION OF THE SUBJECT. (*Annals of Otology, Rhinology and Laryngology,* September, 1908, p. 787.)

This paper is to report eight cases and follows a previous paper read three years ago before the American Laryngological Association.

CASE I. Boy of six, symptoms of a year's duration; tracheotomized for severe dyspnea. Papilloma had been removed in February and October, 1901. In February, 1902, the larynx was free but a large mass was seen below the glottis. This mass gradually diminished and the tracheotomy tube was taken out in March, 1906, the fistula dissected out and the wound sewed up, with complete recovery. The boy had thus worn the tube five years.

CASE II. Boy of nine, hoarseness for six months and dyspnea for two weeks. Tracheotomy done in August, 1904, and the growth removed the next month; after some recurrence and removal, the tube was removed after wearing it one year and nine months. Result, good voice and cure.

CASE III. Girl of six, large papilloma hiding the glottis. Tracheotomy done and growth removed, July, 1904. The growth rapidly recurred and she had pneumonia in June, 1905, and in November, 1905. She finally died in February, 1906, of exhaustion and pyemia.

CASE IV. Girl, aged two years. Came to hospital in August, 1904, for hoarseness and dyspnea. Larynx filled with papilloma. Tracheotomy and removal of growth in October. In September, 1905, the growth was seen presenting at the tracheal wound and a portion was removed the following January for an attack of asphyxiation. The remaining portion removed July, 1906. Tracheotomy tube left out in April, 1907, and fistula closed a year later. She had worn the tube nearly four years.

Two of the four remaining cases are now without the tube and may be considered cured, and two were not heard from.

In summing up the treatment, the author states that it is his aim to get rid of the papilloma in the shortest time and at the least risk to the patient. The voice should not be impaired. The advisability of operating without a previous tracheotomy must be a matter of judgment. If the growth seems to be rapid, it is well to do a preliminary tracheotomy. Repeated operations for removal of recurring growth when not obstructive, are not advisable. A cure is possible by simple tracheotomy and time. The presence of papilloma makes a child susceptible to bronchial troubles and proper hygiene is very necessary while wearing a tube.

The author states that laryngo-fissure is never applicable to these cases. S. W. THURBER.

MEDICINE.

PORTNER, ERNST: CYSTOSCOPY AND URETERAL CATHETERIZATION IN CHILDREN. (*Deutsch Med. Woch.*, October 22, 1908.)

The author believes cystoscopy and ureteral catheterization to be especially applicable in childhood. However, certain cases should not be subjected to these procedures: (1) Those in which the urine shows no pathological elements; pus and blood are the prime indications; (2) where the hematuria is merely a symptom of general bleeding, or where casts prove it to be due to a nephritis; (3) where the pyuria yields rapidly to treatment, such as bladder irrigations. If the hematuria or pyuria is of uncertain origin after four weeks, the above methods of diagnosis should be employed and will solve the question. In the case of girls both methods may be used as early as one year of age; in the case of boys, cystoscopy is feasible at the age of two, and ureteral catheterization at the age of eight. In the former especially the instrument is preferable, for boys it is essential. These methods are in no way harmful, but should be carried out under narcosis.

Among other cases the author details successful cystoscopic examination in the case of a girl baby of twenty months and one of twenty-six months. In the one instance a vesical calculus was seen, which, however, was diagnosed as soon as the instrument entered the bladder; in the other a diffuse cystitis. Details of the ureteral catheterization are not furnished. In addition the functional renal tests, such as cystoscopy, the phloridzin and the indigocarmin tests were made use of with the same success as in adults. ALFRED F. HESS.

FREEMAN, ROWLAND G.: THE DIAGNOSIS OF PNEUMONIA IN INFANCY. (*The Journal of the American Medical Association,* July 25, 1908, p. 285.)

The author thinks that text-books lay too much stress upon making a diagnosis from the physical signs. The clinical picture he considers is too typical, that physical signs should be looked for to confirm and locate the lesion only. The symptoms on which a diagnosis of pneumonia can be based, are sudden onset, depression, rapid respiration with a ratio to pulse of 1:3, fever and unusual cough. If with these there are present flaring nostrils, pneumonic breathing and a respiratory grunt, a definite diagnosis may be made. Rigidity of the neck and upper extremities without rigidity of the lower extremities is an important confirmatory sign when present. G. R. PISEK.

CARTER, H. S.: RECURRENT VOMITING. (*Medical Record* June 13, 1908, p. 983.)

The various theories of this symptom complex are considered by Carter and summed up as follows: The condition of cyclic vomiting may be due to first (1) a pure neurosis; (2) a toxic neurosis; (3) an acidosis from a vicious metabolism principally in the digestion of fats, with or without autolysis; (4) a toxicosis from intestinal putrefaction when accompanied by a suboxidative power of the body cells; (5) a rheumatic diathesis.

The treatment is not specific, but the severity of the attacks may be mitigated and their occurrence made less frequent. If due to an acidosis, use alkalies. If there is phenol group poisoning, purge. If due to suboxidation, try thyroid extract empirically. Combat constipation. In prophylaxis, restrict the proteids and carbohydrates in the diet. For the attacks, a cathartic, the use of colonic irrigations with an alkaline solution; in severe cases fluid subcutaneously or intravenously. Rectal feeding may be practiced; remember that it is inadequate and use fully peptonized milk. G. R. PISEK.

LEINER, CARL: ERYTHRODERMIA DESQUAMATIVA (UNIVERSAL DERMATITIS OF CHILDREN AT THE BREAST). (*The British Journal of Children's Diseases,* June, 1908, p. 244.)

Leiner describes a peculiar dermatitis which he names erythrodermia desquamativa and which is to be distinguished from Ritter's dermatitis. It occurs in the first few months of life, attacking nurslings mainly. It is a universal skin disorder of the entire cutis, running a chronic course and accompanied by a desquamation of the epidermis and a seborrhea capitis. The etiological factor is thought to lie in the mother's milk. The affection is probably an autotoxic erythema occurring always with an intestinal disturbance. G. R. PISEK.

MORSE, J. L.: OBSCURE FEVER IN INFANCY AND EARLY CHILDHOOD. (*Boston Medical and Surgical Journal,* July 9, 1908.)

Lack of careful physical examination often accounts for the failure to diagnose thoracic diseases, such as empyema. The physical signs may be limited to a small area high up in the axilla or to the middle of the back near the spine, regions which are not often examined with sufficient thoroughness by the general practitioner. A subacute endocarditis may cause elevation of temperature for weeks and months without giving any change in the physical signs. Failure to diagnose typhoid and malaria is now almost inexcusable, as it is due in most important cases to the fact that the blood had not been examined. Fever of long duration can be produced by an eczematous affection of the skin. It has long been supposed that fever in the newborn is a symptom of starvation, but the author thinks that in most cases it is the result of sepsis. Dentition, in the author's opinion, is only an occasional cause of fever. That fever can be produced by chronic disease of the tonsils, and adenoid tissue is not generally recognized, yet such is not rarely the case. Fever when due to this cause ceases immediately after an adenectomy. Cervical adenitis may produce a long continued fever. The enlargement of the glands is not always due to tuberculous infection. In fact, any source of irritation in the mouth, nose and throat, can produce an inflammatory condition of the cervical glands. The existence of inflammation of the bronchial glands is often difficult to prove, even by Roentgen rays.

Pyelitis is not infrequently an unsuspected source of continued fever. It is usually secondary to the diseases of the gastroenteric tract, but it may also be primary. It is usually due to infection with the colon bacillus. An examination of the urine usually establishes the diagnosis, as it usually contains some albumin, many pus cells, some caudate cells, a few hyaline fine granular casts and squamous cells. The reaction is acid. The temperature is usually high and irregular.

The diagnosis of chronic diffuse tuberculosis and of tuberculous lymph-nodes is sometimes difficult. The history of exposure and the tuberculin reaction are of value. Acute intestinal toxemia is a very common cause of fever in infants. This is attributed to the functional activity of the cells of the mucous membrane of the intestines and the liver, and to the undeveloped and more irritable condition of the nervous system at this period of life. Chronic intestinal toxemia occurs more often in older children. It is most often due to ingestion of proteids. Few or no gastrointestinal symptoms may be present in these cases. Another cause of continued fever is chronic duodenal indigestion. In these cases we have acute attacks of pain and vomiting of bile, slight jaundice and hard and white or soft and clay-colored stools.

There are some infants in whom the ingestion of the smallest quantity of milk is followed by a rise in the body temperature. This intolerance may continue throughout the whole period of infancy; usually, however, the condition is temporary.

In conclusion the author makes the significant remark that if a careful examination and continued study of a case fails to reveal the cause of the fever, nothing serious is the matter with the child and no cause for anxiety exists. HENRY HEIMAN.

BUTLER, J.: SERUM DIAGNOSIS OF SYPHILIS. (*Journal of the American Medical Association*, September 5, 1908, p. 824.)

The author gives the history and describes the complement fixation test of Wasserman in syphilis. Butler holds that the large proportion of positive results in syphilitics and suspected syphilitics, and negative results in controls indicate the reliability of the Wasserman Test. He made the test in one hundred and twenty-five cases; of these twenty could be reasonably excluded as non-syphilitic and were used as controls. Among these were cases of pneumonia, typhoid, neurasthenia.

Butler summarizes his conclusions as follows; the serum reaction for syphilis is specific. A positive reaction will be obtained in from ninety to ninety-five per cent. of cases with syphilitic manifestations, and in fifty to sixty per cent. of latent cases. It is also found positive in from seventy to eighty per cent. of parasyphilitics. A positive reaction indicates activity of the specific virus and is an indication for treatment. While a positive reaction is confirmatory, a negative one has not the same negative value. Its failure does not indicate a cure. It is diagnostic simply of a systemic infection, either acquired or inherited. It is of great value in making a differential diagnosis. G. R. PISEK.

SURGERY.

STUCKY, J. A.: OPERATION FOR BRAIN ABSCESS OF OTITIC ORIGIN. (*Annals of Otology, Rhinology and Laryngology*, June, 1908, p. 427.)

The diagnosis of brain abscess is often uncertain on account of the absence of the two prominent symptoms, *i. e.*, pain in the head and vomiting with little or no nausea. The author, in this paper, refers to three cases and the treatment followed in each. Case one, a child of twelve years, which had had a discharging ear, which ceased to discharge suddenly and developed apathy, rigors, slow pulse and paralysis of groups of muscles. The pain was described as "way down in the ear." The method of operating is first to do a radical tympano-mastoid exenteration; then expose the middle fossa and search for the infected area as indicated. The constant use of hot saline solution is very important. All oozing may be well controlled by this means. All parts kept clean and bone dust washed out. Perforated rubber drains are used to the exclusion of other kinds. S. W. THURBER.

MAGRUDER, W. EDWARD: CONGENITAL UMBILICAL HERNIA, WITH REPORT OF CASE. (*Medical Record,* September 5, 1908, p. 393.)

The author classifies this type of hernia as follows: (1) Hernia of the root of the cord; (2) sacculated hernia; (3) eventration. Lindfors states that this condition occurred once in 5,184 cases. Block saw one case in 5,000.

The author reviewed 160 cases, of these 126 were operated upon, and of these 84 recovered, 40 died, the result of 2 not being known. He thinks that no one method of operation is the best, but that the technique must be chosen to suit the case. Mayo's method the author thinks is superior to any other for adults, but it is not applicable to the infant on account of the necessary resection of tissue which it involves. The author thinks simple laparotomy with extirpation of the sac and suturing of the freshened borders is sufficient in the majority of cases. The time of operation should be as soon as possible after birth, because the desiccation of the sac will soon become the starting point of inflammatory processes in the viscera. The operation and anesthetic are borne well if no undue time is lost. G. R. PISEK.

HYGIENE AND THERAPEUTICS.

BIRK, W.: THE VALUE OF HOMOGENIZED MILK IN INFANT FEEDING. (*Monatschrift für Kinderhk.,* June, 1908, p. 129.)

One of the most important differences between human and cow's milk is the size of the fat globules. In human milk the fat globules are small and of uniform size; in cow's milk they are larger and of varying sizes.

By the process of homogenization, which is accomplished by means of a specially devised machine, the large fat globules of cow's milk are broken up into globules which are even smaller than those of human milk. Recently this kind of milk has been extensively used in France and Belgium. Several French observers, among them notably Variot, have claimed uniform success in feeding infants with this milk. They attribute this fact to the more ready assimilation of the fats and proteids. The author takes exception to this claim. He found that in healthy infants as well as in those suffering from gastrointestinal disturbances, homogenized milk offers no advantages over the ordinary cow's milk. HENRY HEIMAN.

KEPHALLINOS, MKOS. A.: THE PARAFFIN TREATMENT OF PROLAPSE OF THE RECTUM IN CHILDREN. (*Jahrbuch für Kinderhk.,* March 2, 1908, p. 325.)

This condition, which is not infrequent in children, has been treated by the injection of ferric chloride, strychnine, ergotin; by the local application of alum, tannin, nitric acid and silver nitrate; by electricity; and by strapping. In obstinate cases various operative procedures have been recommended. In mild cases palliative treatment may prove beneficial, but rarely is a permanent cure achieved by these means.

All the operative procedures heretofore recommended have been based on one of three principles—namely:

(1) Narrowing of the anal opening.
(2) Removal of the redundant mucous membrane.
(3) Partial or total ablation of the prolapsed tissues.

All these measures are radical in nature and are often a serious ordeal to delicate little patients.

In 1904 Spitzky proposed a new method of treatment, namely: the injection of paraffin in the pararectal tissues. The paraffin, after solidifying, forms a supporting column, which fixes the rectum and prevents a prolapse from taking place. He claimed that this method was simple and free from danger. The injection is made with a syringe of 5 c.c. capacity, to which is attached a large needle 10 cm. in length. A paraffin of high melting point (40°-50°) is used. It is kept liquid in a water-bath at 60°-65°, previous to being drawn into the syringe. Over the syringe is drawn a piece of rubber tubing in order to retain the heat and prevent the paraffin from solidifying in the syringe.

The technique of this simple operation is described as follows: The patient is lightly anesthetized with ether, placed in the knee-chest position, the prolapse is replaced, and the anal region properly disinfected. The left index finger is then inserted into the rectum; with the right hand the needle is plunged its full length into the pararectal tissue about 1 cm. from the rectum, to one side of the median line, along its posterior wall. While the needle is gradually withdrawn, the paraffin is slowly injected, thus forming a column of uniform thickness along the posterior wall of the rectum. This procedure is then repeated on the other side. After the injection adhesive plaster is applied to the nates, and the child is kept in bed for two days.

Thirty-two cases have been treated by this method at the Grotz Royal University Clinic (Spitzky's service). Only one recurrence has been reported to the present time. In one case paraffin was passed by the rectum about one year after the operation, but no recurrence of the prolapse took place in this case. The danger of embolism is very slight. The author has never observed this complication.

He recommends this method in those cases where proper dietetic and mechanical treatment has failed to effect a cure.

HENRY HEIMAN.

NORTH, CHARLES E.: A METHOD OF MILK PRODUCTION. (*Medical Record,* February 15, 1908, p. 263.)

By means of tables the author shows that by milking cows into sterilized pails and even without changing the unsanitary condition, the number of bacteria will be reduced. This single improvement in the handling of milk would require very little extra outlay and would put the price of fairly pure milk within reach of the masses, and also give the farmer a fair profit. The author suggests a sixteen-quart can with a narrow opening, which when full would be closed tightly. The milk should be delivered to the creamery in this sterile can and not poured into a larger utensil. The dairy house for washing and sterilizing utensils, and cooling and bottling of milk, may be several miles from the farm as long as the milk is delivered there within one hour of milking.

The creamery should have added to it a washing and sterilizing plant for all the milk utensils of all the contributing farmers. Cooling and bottling of milk should be done at the creamery only. Five cents a quart to the farmer would compensate for this improvement in handling the milk. Concentration of operations at the creamery for a large number of farmers would be business economy and would likewise eliminate many sources of contamination.

G. R. PISEK.

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ORIGINAL COMMUNICATIONS.

FRESH AIR IN THE TREATMENT OF DISEASE.*

BY EDWIN E. GRAHAM, M.D.,
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One must always study all the factors leading up to, and possibly causing disease, and before deciding the positive influence of one factor, eliminate wholly or in part, other etiological influences.

In considering, therefore, the rôle that fresh air plays, “controls” should be employed, as far as possible, for the comparison of a series of cases of the same disease in the same type of cases living under similar conditions, should enable one to draw fairly accurate conclusions.

My first work in fresh air treatment began some eight years ago in the children's ward of the Philadelphia Hospital. The wards were large, the milk fairly good, enough nurses were on duty to keep the children fed according to my directions, they were bathed regularly and kept clean; but in the wards where the very young infants, mostly foundlings, were placed, the results were very unsatisfactory. Much depended upon the physical condition of the infant on admission. A frail infant, perhaps premature and under normal weight, would gain for a few weeks at best, then remain stationary in weight, finally gradually lose weight, begin to have diarrhea and die. Robust infants on admission often did well for three months. The same symptoms after this period began to develop as in the infants admitted in a condition of malnutrition and in spite of my best efforts, many of these robust children died.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 26, 1908.

The same type of infants in my private practice were almost without exception, doing well. Convinced that neither the food, nursing, nor general care of these hospital infants was at fault, and that the so-called hospitalism was nothing but lack of fresh air, and lack of out-door air, I ordered these children, in the month of January, placed for two hours each day on the fire-escapes.

The cribs were simply moved out upon the fire-escapes, and towels pinned over the top of both ends of the crib, as wind shields. The infant mortality began to lessen immediately, and I began to see some hope for my infant hospital patients. In the following two or three years, during my service in January, February and March of each year, I had the children, for a number of hours each day, unless it was raining or snowing, carried down to the large open space facing the hospital buildings, and kept in small hammocks. These infants were always bundled up in blankets, their heads well covered, and their eyes, nose and mouth covered with a gauze veil. They did remarkably well; so well, in fact, that instead of my infants dying, most of them began to gain in weight and health, and the deaths were almost entirely in infants under three months of age, whose condition was distinctly bad upon admission to the hospital.

During the past five years the infants have been placed in the new modern and up-to-date building of the Philadelphia Hospital. The wards are large, the air space ample, the milk the very best; porches surround the hospital on two sides, the infants practically have an abundance of fresh air day and night, and they do as well as could be hoped for. I am no longer a pessimist when in the infants' ward, but an optimist. In the new Jefferson Hospital, where I am on duty the entire year, the children have an ideal ward on the eighth floor, large windows on three sides with a large roof garden adjoining, the latter fitted up with every convenience, such as hammocks, shade, wind shields, etc. The roof garden is used all the year round, winter and summer, and the results are most encouraging.

Of all the factors which have contributed to the reduction of this infant mortality, fresh air has, in my opinion, been the one of prime importance.

During the last three years in my service in the Philadelphia Hospital, I have treated all my severe cases of broncho and lobar pneumonia in children of all ages by the fresh air treatment. These infants and children, as soon as taken ill, are removed from the general ward and placed in a special room provided for such cases. The room holds six cribs comfortably, and rarely, during my service in the last three years, has a bed been vacant. Many of these cases are secondary bronchopneumonia. A large percentage of the children, in fact most of them, are hospital children, but the results have been so different from the old plan as followed years ago, that I have lost more or less my dread of pneumonia as a hospital disease. True, these cases have good nursing, good care and every possible attention, but still they are cases of pneumonia in hospital practice and they do remarkably well.

In another similar room in the same hospital, during the same period of time, I have been treating my typhoids. Occasionally, I have a typhoid under two years of age, most of them are over three, and the average age about six years. The typhoid cases come from the same class of patients as the pneumonias, and they do so much better in the fresh air that nothing could persuade me to return to the old method of treatment, similar in every way to the present, but *minus* the fresh air. The rooms where the typhoids and pneumonias are kept have large windows on two sides, and an open door on a third side; these are kept open day and night; a distinct effort is made to keep the hands and feet of these children warm by gloves, stockings and hot-water bags, but the rooms are always cold, except for a few minutes every two or three hours, when the windows are closed and all the children carefully examined as to cleanliness, etc.

The few cases of tuberculosis are kept in a special portion of one of the porches, living practically in the open air. Arrangements are just being made for a special pavilion for these cases. In the Jefferson Hospital the pneumonia and typhoid cases are treated by the fresh air method and do infinitely better than formerly, when the fresh air treatment was not employed.

In private practice for five years I have treated all infants and children, sick and well, with fresh air; in fact, on my first visit to the child, I, if possible, instill into the mother the principle that fresh air differs from impure air as much as fresh milk from impure milk. Once gain her consent, and the treatment is an assured fact. I am more than surprised to see the willingness with which most mothers, no matter what their social status may be, enter into the treatment. The physician must be enthusiastic; the mother is, in my experience, easy to convince. It would be easy for me to give the histories of cases, but the time allotted to me is brief. Suffice it to say, that in many cases during the winters and summers of the past five years, I have kept numerous infants out of doors all day long, except bringing them in occasionally to the house for the purpose of removing soiled clothing, and I have never in all that time seen a single injurious symptom result, and I am positive it has been the means of saving many lives. Rickets, scrofulosis, gastrointestinal disease, any and all conditions are benefited by the treatment. Measles, in hospital cases, I treat in separate rooms, each room opening upon a common porch, surrounded by glass. During the first few days the children are kept in the cool, darkened rooms, then moved to cribs on the porch, and the windows on the porch opened more or less, insuring an abundance of fresh air. The influence of climate associated with rest in the treatment of nephritis and cardiac disease is now so well recognized that comment is unnecessary.

It is an interesting question, which experience alone can decide, as to what arrangement will, in the future, be made to control the *degree* of temperature in which these children are kept when in the fresh air. In hospital practice it has been my custom to keep infants under three months for a few days in the cool air of the ward before putting them outdoors—the temperature of the ward usually being near 60°F. in the cooler months. In private practice, where the temperature can be more absolutely controlled for each individual case, I gradually but rapidly lower the temperature of the room to 60°F., then dressing the child exactly as if it were to be taken outdoors, gradually lower the temperature of the room for a few hours each day until it approximates the degree of temperature in the fresh outside air. Indifferent temperature feels neither warm nor cold (Wachenheim), and is most restful. In children, indifferent temperature is above 75°F. in summer in summer clothing, and above 65°F. in winter in winter clothing, and varies with age and vitality. Temperatures above indifferent are not sedative, but cause a continuous stimulation that is harmful if prolonged, ending in exhaustion. The same author says that, "Young children stand severe cold badly." This is not my experience, if by "severe cold" is meant the ordinary winter weather in Philadelphia. True it is, that these children are bundled up from head to foot, lie in a comfortable baby coach, and have thick gloves, stockings, veil and perhaps a hot-water bag, but they do breathe the cool air, and they all do well. Two or three rainy or snowy days will convince any one; the children are kept indoors in a warm room and they fuss and cry; out of doors they are quiet.

Humidity has an influence by checking or increasing the evaporation from the body and further studies along this line will be of value.

The distance above sea level exerts a certain distinct influence upon the skin, kidneys and blood, and induces metabolic changes of importance. The influence of a few months of camp life on growing boys is appreciated by every one. "Camp life" is fresh air treatment.

When it is possible to select the kind of fresh air desired, certain broad lines may be followed. Increase of heat production, and, consequently, an augmented metabolism, are rendered necessary by cold, dry air of high altitudes. This is proven by the larger amount of carbonic acid gas given off by the lungs. It also, as a rule, increases the red blood cells during the first few weeks of treatment. High altitudes are useful in children with incipient tuberculosis, or an inherited tendency to tuberculosis.

Fresh seashore air is of decided benefit in infants and children convalescing from severe illnesses, especially gastrointestinal in type. It is of distinct benefit in the so-called strumous type.

Fresh country air is better than fresh city air. Rural districts are better than urban, but density of population, such as one sees often in large cities, does not necessarily imply lack of fresh air. The number of people living in a given area may be very large, but if they live in comfortable houses, keep the windows open and live under the best hygienic conditions, fresh air can be secured in abundance, and infants and children do well. If the same number of people living in the same area do not have an abundance of fresh air, the infants and children do badly. Density of population may have much or little to do with fresh air.

Statistics prove conclusively that in *all* countries where the mothers' work in industrial plants, necessitating their absence from home a large portion of the day, that the infants and children show a much higher mortality rate, owing to the fact of their being kept indoors, than among the children of the same class of people living under exactly similar conditions *except* that the mothers live at home and have time to keep their children in the fresh air.

In Berlin, 1903, Newman investigated 2,701 infant deaths. Where the families were in one-room dwellings he found 1,792 deaths; in two-room dwellings, 754 deaths; in three-room dwellings, 122 deaths; in larger dwellings, 43 deaths. Can anything prove more conclusively than this, the power fresh air has to preserve life, or the rapidity with which bad or impure air can cause death? Unfortunately for the infant and young child, the ignorance of many mothers, the superstitions and traditions of others, and the carelessness of a few, are the greatest barriers to the keeping the children in the fresh air. During the past few years comparatively little has been written upon the importance of fresh air for very young children, and yet the subject of fresh air as an aid in the treatment of disease is not of recent date. In the History of the Medical Society of the State of New York, as published in the *New York State Journal of Medicine*, it is shown that in the early part of the nineteenth century the dangers of dust laden air were recognized; the influence that certain occupations exerted upon the etiology of tuberculosis was appreciated, and even at that date "cold air" was used in the treatment of typhus fever.

In one of these essays upon "The Influence of Trades, Professions and Occupations in the United States on the Production of Disease," the author shows clearly how the crowding together of children in the tenement districts produces gastrointestinal disease and death, proving that at this distant period the virtue of fresh air was appreciated.

In 1850 to 1860 Dr. Clarke treated a very large number of cases of typhus fever in Bellevue Hospital by the fresh air method. The windows were removed; in winter stoves were placed before the open spaces to insure a slight heating of the air, but the patients were given the fresh air treatment, as we understand it in the fullest sense to-day. The results were vastly superior, the death rate very markedly lower than the mortality among the same class of patients in the same hospital at the same period in the hands of the other members of the staff where fresh air was not used. It is a well-known fact that in times of war patients treated with fresh air in tents always do better than those confined in hospitals.

The phenomena of child life have often occupied the attention of psychologists, and new theories are formed every day for children by educators. Theoretically, they are making the superchild, soon to be the father of the superman. We, however, should be quite content if parents can be taught to appreciate the advantages accruing to the child from correct feeding, combined with fresh air and the influence they exert upon the mental and physical development of the growing child.

Everyone should be made to understand how important it is for the very young to be taught how to stand, lie down and sit properly, and that deep breathing is the proper and only sure way to secure full lung expansion.

Let us all join hands and preach fresh air; vote for open squares, endorse roof gardens, have adenoids and tonsils removed, and if we are willing as a society to endorse and work for the fresh air treatment with the same zeal and enthusiasm as we have worked for fresh and pure milk, our results will be as great a success as has been secured by our milk enthusiasts.

Discussion on page 91.

POST-OPERATIC TREATMENT OF ADENOIDS.—Bryant DeF. Sheedy (*American Journal of Surgery,* March, 1908) says: (1) Keep children in bed for from two to three days after operation, and away from other children. (2) Keep parts clean by use of alkaline washes and medicated mentholated oil solution. (3) Use constitutional and reconstructive medication. (4) See that thoracic gymnastics are practiced for a long period. (5) Oxid of zinc plaster over the mouth at night to keep the mouth closed until normal breathing is established. (6) Watch for return of the growths.

FRESH AIR IN THE TREATMENT OF DISEASE.*

BY W. P. NORTHRUP, M.D.,
New York.

There are two points to be discussed: First, the class of cases to which this treatment is especially adapted and in which it has been thoroughly tried; second, the practical application of the method, its working out in detail after much observation and experience.

There is no doubt that open-air, boldly administered, is a method of cure; that it is being promptly accepted and almost universally adopted by the younger members of the profession, and that it has come to stay.

The title reads "fresh air," etc. I could wish that it had in some way included the words "open air," "cool air," or "cold, flowing air." Every musty text-book in the back row of the stack-room ceremoniously includes under "treatment" the words "fresh air," and forthwith proceeds to recommend exclusion of drafts, to hint at blankets in the windows, lint in the sash cracks, etc. In other words, "fresh air" is an indefinite term, a conventional expression, and may mean nothing.

Hot air may contain the requisite oxygen, cellar air may be cool, both may miss the invigorating effect so conspicuously present in open air; that is, in uninclosed, atmospheric air. If it ever is entered in the U. S. P. and standardized for therapeutic use, it should read something like this: "Open air, or cold, fresh, flowing out-door air, dosage regulated to individual needs."

SOME OF THE PHYSIOLOGICAL EFFECTS OF COLD, OPEN AIR.

When the New York Health Department first began to put the tuberculous insane out in the open air to sleep, in shacks, the first important observation noted was, that the patients *slept*, slept without their usual sleeping mixture, *without dope*. This was the regular result. I have observed the same in fever children. From being restless, dusky, and even delirious, they become quiet, of good color and given over to sleep. They often sleep for several hours together, quietly. Next, it is noted that they take their food better; finally that recovery is hastened and completed earlier. These remarks apply more completely to those acutely sick, dopy from toxemia, their case running an acute course. Pneumonia furnishes the best illustration of an acute infectious disease benefited by open-air treatment.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 26, 1908.

CLASS OF CASES.

I am most familiar with the open-air treatment of pneumonia, scarlet fever and several of the exanthemata, including those with bronchitis and marked cough. I do not hesitate in any of the above cases to put them out of doors in all sorts of weather. As to measles, I am not prepared to state that I have had much experience. I leave it to the members of this society to say whether measles, with its accompanying moist skin, its bronchitis, its tendency to ear complications and its lurking tendencies to accidents, shall be put out of doors. To be consistent, I should say these accidents are due to spreading infectious lesions, and that out-door air would not unfavorably affect them, but at this moment, I am not willing to give a final judgment. I may add just here, that apart from measles, I do not hesitate to put in the open air bronchitis, nasopharyngitis and laryngitis. I do not find that the cough is made worse or the lesions increased. Rather the contrary; the cough becomes less and sleep follows.

PRACTICAL APPLICATION.

In speaking of open-air treatment, I have constantly in mind the conveniences and methods to be observed at the Presbyterian Hospital (New York), open-air ward. A cold ward, or cold open room, presupposes an adjacent warm "grooming" room. Dressing and washing of patients should be done in warm rooms. Patients when once made comfortable, can then be exposed for hours to cool or cold fresh flowing air, and remain comfortable. Here let me say—*the patients and nurses should be made comfortable all the time.* The nurses should wear overcoats or blankets about their shoulders. They have not the appearance of thoroughly applying the open-air treatment in winter until they wear heavy wraps. The patients should be comfortable; then they will like the treatment. To this end the dressing of the bed should be carefully studied out. The following is our present plan in the Presbyterian Hospital. The first requisite is that there should be as much bedding below the patient as above. First a huge, enveloping, extra-sized blanket should be spread upon the bedsprings. Upon this, a rubber blanket or thick paper; then the mattress; upon this a blanket; upon this, again, the sheets, and over these other blankets. After the patient has been well tucked in with the usual bed-blankets, the aforesaid extra-sized, first blanket should be brought round the sides and up from the foot and pinned from chin to toe. At last, the top surface of the bed should look like a huge postal envelope fastened along the middle line, the foot piece coming up to be joined to that line. The copious head folds should envelop the mattress and come down beside the head, the face and chin just emerging. The primal requisition is to construct a huge bag in which the patient may move somewhat without air getting in between the blankets. One other requisite is that the patient should wear a complete suit of light flannel underwear under the nightdress. Whether he wear a night-cap may depend on the individual patient's wishes, upon the amount of hair, etc., etc. He *must* be made comfortable.

In presenting the subject for discussion, these two points have been emphasized:

(1) All febrile cases, measles possibly excepted, may be safely and to advantage treated in the open air.

(2) The comfort of patient and nurses is essential.

To this end the bed must be carefully prepared, as much clothing below the patient as above. The patient should wear a complete flannel suit next to the skin. The nurses should have no false pride about wrapping themselves sufficiently to be comfortable. The best success is to be obtained only in facing the problem fairly and taking for a motto: "Make everyone comfortable."

RESULT.

I have no percentages, no tabulations to present. The success of the treatment must rest on the individual impressions of those making use of it. My own impressions and convictions from my own experience justify the following statement: *Open-air treatment has killed no one, has injured no one, has helped everyone, and determined a cure in a few.*

DISCUSSION OF PAPERS BY DRS. NORTHRUP, GRAHAM AND CHAPIN.*

AUGUSTUS CAILLÉ, M.D., New York.—I am in full harmony with everything expressed by the three essayists. Twenty years ago when I entered the babies' wards I tried to get the ladies in control there to understand the importance of cold fresh air to children, and some of them suggested that it was dangerous and that the babies would have to be boosted up with strychnia and other drugs. At the present time we have a roof garden, a part of which is covered and a part open, and a cold air ward, etc.

I endorse most emphatically the views of Drs. Northrup, Graham and Chapin. I believe that the breathing of cold fresh air is the most important therapeutic agent that we have.

A. JACOBI, M. D., New York.—I have been particularly interested in Dr. Chapin's paper. In the year 1870 I was a member of the medical staff of the Nursery and Child's Hospital, the pet institution of the elite ladyships of New York City. When I proposed boarding out infants and taking the curtains from the cribs, and when I proved that of 100 cases admitted to the hospital and retained there over three months 100 died, I was expelled from the institution. I was first told to resign, but I was correct in my views and told them that I was not of the resigning kind; that I would rather be expelled. They told my colleagues that if they did not expel me they would risk their own positions, and I was expelled by my own colleagues. We see how times change. I approve heartily of the endeavors of Dr. Chapin. He is a practical man and knows his business, and he has certainly been more successful than I was, perhaps because he is more circumspect.

There is a disease that has not been mentioned at all, a disease that fifty years ago we hardly knew in the United States. Since immigration and poverty have increased we have a great deal of it—I refer to rachitis. The disease is attributed by many to bad food. It is more due to bad air than to bad feeding. That is proved by the northern Russians and Swedes who have rachitis in their best families, because their winters are eight or nine months long and the babies are not removed from their close quarters. I had a patient about forty years ago, now one of the better known surgeons in New York, who had craniotabes; he had convulsions; he was at that time a child of seven or eight months. The only thing that saved him was our taking the baby away from the house and keeping him outdoors all winter. From the first hour the baby no longer had convulsions, and, in spite of his craniotabes, his brain was kept in such good condition and developed so well that now, not only is he a successful surgeon, but, what is more, he is a good doctor.

R. G. FREEMAN, M.D., New York.—As to measles, I would relate two experiences. In the Nursery and Child's Hospital, in 1907, there were two epidemics, 71 cases and only 1 death. I think that is quite a remarkable showing. The second of these epidemics occurred while I was on duty and was a very severe one. We had a good deal of complicating otitis and a moderate number of complicating pneumonias. The whole ward afterward came down with bowel trouble, and it became necessary to make some change in what we were doing if we were to avoid a high mortality. It was in December, but the children were put outdoors and after that we had a rapid recovery from the diarrhea and no deaths at all. Later on, in March, I was on duty at the Foundling Hospital, where we had an epidemic of measles and scarlet fever. During this time cases of measles began to break out in the scarlet fever wards and there was no place to put them. Outside the ward was a closed piazza, and this we used for isolating these cases. All the measles cases were put out and they did remarkably well. One case had bronchopneumonia, starting with the measles, and that case did well too. So, I think, measles is very well treated by fresh air.

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* Dr. Chapin's article on "A Plan of Dealing with Atrophic Children" appeared in ARCHIVES for July, 1908.

Dr. Jacobi said something that interested me very much as to the etiology of rachitis. I have felt convinced for some time that it was a disease of asphyxiation. The fact that it is a disease of cold climates and of winter; that they are worse in the spring and better in the fall; the failure in animal experiments to produce the disease with different forms of feeding, and the fact that it occurs most remarkably in races accustomed to warm climates where they live out of doors, as the negroes and Italians, all point to this conclusion that it is a disease of bad air.

J. P. Crozer Griffith, M.D., Philadelphia.—I would call attention to the fact that there is a difference in the way men use the term "fresh air," and that this leads to confusion sometimes, and I think this has done on this occasion. Among those speaking on this subject today three different things have been referred to under the term of "fresh air treatment," namely, the breathing of *fresh* air, the breathing of *cold* air, and the *exposure of the body* to cold air. It is evident that we are dealing with different conditions. When Dr. Northrup exposes a child with scarlet fever, having a temperature of 107°, to cold air to reduce the temperature, it is manifestly a very different thing from placing a patient on a roof garden to breathe fresh air. So, too, when an authority is quoted to the effect that children in the first few months of life bear cold air badly, it is manifest that reference is made to the *chilling* by cold air, not the *breathing* of cold air. Whether or not the exposure to cold air for the sake of reducing hyperpyrexia is to be recommended—and I see no reason against it—there can scarcely be any discussion as to the advisability of having sick children breathe fresh air, whether warm or cool. As to the possible danger which may come from the exposure of the body to cold air, which the breathing of cold air might necessitate, that would seem to depend largely upon the nature of the disease. We all realize the difficulty or impossibility of giving a child a cold while it has fever. On the other hand, none of us would expose a very young marantic child in a cold room and take the covers off of it.

E. M. Buckingham, M.D., Boston.—The last speaker said what I was about to say, only much better than I could have said it.

It is a clinical fact that certain hospital pneumonias with dyspnea are given oxygen in the common way without relief, but are relieved when their beds are placed in the open air out of the wind.

C. B. Putnam, M.D., Boston.—For the last thirty-five years I have been connected with the Massachusetts Infant Asylum. When I first went in they were just beginning to farm out a few of the children. Since then this has developed to such an extent that of 125 patients less than 25 are kept in the hospital. The rest are boarded out in the country and there has been a remarkable reduction in mortality. The hospital is used partly for those who come in in an emaciated condition and need special nursing and partly for those who get sick while in. We find some cases suited for hospital care a part of the time.

L. E. LaFétra, M.D., New York.—Just a word in regard to the objections made to the treatment in private practice. These can often be overcome by using the inside awnings or window tents, which allow the child to breathe the fresh air without being exposed. We have learned to do this in the treatment of tuberculosis and I find that it is very satisfactory.

Charles G. Kerley, M.D., New York.—Typhoid is a disease in which I have been particularly interested with respect to this fresh air form of treatment. I have had very little trouble in applying the treatment in private practice. In fact, I have been surprised at the readiness with which intelligent people take it up. The people are prepared and ready; they have been made so by the plans for the treatment of tuberculosis.

I think Dr. Chapin's paper is most excellent; he has struck the key note of the management of these cases of atrophic infants, and if I were to say anything it would be to simply repeat what he has said with greater emphasis.

There is one point relating to the remarks of Dr. Jacobi and Dr. Freeman with reference to rachitis. No doubt oxygen deficiency has much to do with it, but you give the baby a good breast full of milk when he wants it, of a good character, and he will stand oxygen in sufficiency. Put them on the bottle, give them poor food, badly prepared, and you will get rickets. You get it under bad hygienic conditions quicker, of course, but you also get it under the best conditions. I still believe it is a nutritional disorder *per se*.

Samuel S. Adams, M.D., Washington.—We must draw a distinction between the methods of farming out babies in the time of which Dr. Jacobi speaks and the present time. The present-day method is backed up by means and intelligence; by means that can buy intelligence. They can afford to have competent nurses and skilled physicians. They do not simply board them out, as they did in those days, to some darkey with five or six children who, as I have often seen, would bring them to the hospital surprised that they could not keep "pot-liquor" on the stomach. Now in my city we have a Board of Charities, a board of children's guardians, who watch over the children and they are better supervised. They only give a limited number of children to one person to be cared for.

In regard to the fresh air treatment I have gotten as good results as those mentioned and have been surprised how even the ignorant show a willingness to carry out this treatment. To illustrate this an incident occurred recently; I was called in consultation to see a case in an Irish locality known as "Holy Hill." When I went up to the house the doctor said, "I know what you are going to suggest, but it will not do up here." The child was in a room 10 x 12, with the usual stove, cat and dog, and coal-oil lamp and there were about twenty people in the two rooms. The child, eighteen months old, was lying on a sofa with a temperature of 106° and evidently in a dying condition. I suggested to them that the child would die if kept where it was and that it might possibly be saved if the mother would take it upstairs, wrap up well and sit by the open window with it all night. She said she would. The doctor said he knew she would not and advised me not to be seen in that neighborhood for the next thirty days. Three or four days afterward I inquired about the child and was told that they couldn't get the woman away from the window and that the baby was living and doing well.

F. S. Churchill, M.D., Chicago.—I think people are very ready to carry out this treatment much more willingly than the profession at large think. This is true not only among intelligent people, but among all classes. I have no difficulty whatever in private practice. In my dispensary practice I have had great assistance by having one of the nurses of the Visiting Nurse Association follow up the cases, going directly into the homes and looking after them.

P. J. Eaton, M.D., Pittsburg.—The question of the adaptability of the nurse has much to do with it. Dr. Northrup's famous paper, entitled "23," gave me the inspiration to teach the fresh-air treatment to nurses. I lecture to nurses in four different hospitals and I have found that since giving them such instructions we have a much better chance with the treatment. We now have a corps of nurses who carry out intelligently what we desire along this line.

J. Lovett Morse, M.D., Boston.—We have heard a good deal today about fresh air and cold air for sick babies. I only want to remark that they do no harm to well ones.

A. Jacobi, M.D., New York.—Dr. Adams has suggested that the time of which I spoke was different from the present time—that a good deal of my ill success must have been due to that circumstance—but I beg to remind him of the fact that it is hardly forty years ago and at that time a good many of the principles of good infant feeding were known. I taught the same thing at that time that I still teach and which has proved so successful, and there are a good many of my pupils and friends who have come to my way of thinking. So that these babies appear to have been fed correctly. Moreover, the tendency was at that time not to send the babies out with a negro nurse, in droves, but to send them out one by one to farmhouses just as we are doing now. The Department of Charities had commenced for several years to board out children one by one, and if the example had been followed everything would have been well, but at that time it was the wish, as it always is of people in power, and ladies particularly, to control as many subjects as possible, and they wanted everyone under their roof, and they had to bury everyone. As has been said to-day, that is the result in institutions to-day, and it was then. I am glad to have lived long enough to know that common sense is beginning to prevail, and evidently it is prevailing, for Dr. Chapin has proved it today.

E. E. Graham, M.D., Philadelphia (closing discussion).—I pointed out in my paper that in the early part of the nineteenth century it was appreciated by a few that fresh air was an absolute necessity. We have never had a foundling hospital in Philadelphia, and I think the reason is that in 1871 a number of prominent medical men and others got together and discussed the advisability of erecting one. Dr. Jacobi was quoted at that meeting in 1871 as being decidedly opposed to the foundling hospitals, and the records of the foundling hospital in New York, where such a large percentage of children died, were brought up. At that meeting the idea suggested by Dr. Chapin to-day, of farming out, as they called it then, was advocated. In other words, what we are discussing to-day has been talked about for nearly a century, and boarding out, as suggested by Dr. Jacobi and such as was the unanimous verdict of these medical and legal men was endorsed then. These methods have been practiced by a few men for a great many years, but it seems to me that we are only now beginning to get out ourselves and preach it. If we as a body will be as enthusiastic about this matter of boarding out children and the securing for them of fresh air as we were in our campaign for pure milk we will get excellent results.

William P. Northrup, M.D., New York (closing discussion).—I would emphasize a point that Dr. Graham has mentioned: that we have raised the standard of quality of milk. Now, by paying equal attention to this other hygienic measure, we will bring it into more prominence and greater usefulness. See what has been done in creating a better quality of drinking water by agitating the matter. Air is too cheap; we do not appreciate things until there is a dearth of them.

Dr. Griffith has raised the point that we were not definite enough in our phraseology. I have purposely made my talks concerning pneumonia and its treatment in the open air. If pneumonia can be successfully treated in the open air, other acute infectious diseases certainly can. I think the body breathes the air and needs the stimulus as much as the lungs.

As to typhoid, I am not at all sure that cold air will take the place of the bath. I have tried it a little, but have not had an opportunity to try it enough.

An old pal of Dr. Jacobi's, Dr. Oliver Wendell Holmes, said:

"God lent His creatures light and air and waters open to the skies;
Man locks him in a stifling lair and wonders why his brother dies."

HENRY D. CHAPIN, M. D., New York (closing discussion).—I must say that I feel very deeply on this subject, as for many years I do not think I lived up to my light, and I do not believe many of us have. We have seen hundreds of these babies slip through our hands under the usual methods of treatment in institutions. I have had the best hospital wards, roof gardens, convalescent homes especially for these cases, and yet it was the same thing; every baby under one year of age did badly if kept long. History is repeating itself, and the time has come when we who are supposed to know something about this thing should speak, and in no uncertain manner.

With regard to the boarding-out system: the plan I follow is not simply farming out; it is putting them out in a restricted area of the country, with skillful doctors and trained nurses and with people who can be watched. There are all kinds of objections. Some said you will kill these children, but it is not true, and they will all do better in this way.

THE VON PIRQUET TEST IN CHILDREN.—Feer (*Münch. Med. Woch.*, No. 1, 1908), speaking from his experience with Von Pirquet's reaction in over 300 cases, believes it to be of great diagnostic importance in tuberculosis in children. The younger the child, the more serious is the prognosis to be put upon a positive reaction. A negative reaction may be taken as positive proof of the absence of tuberculosis. The article includes a clear description of the technic, and of the papule appearing with a positive reaction.—*Boston Medical and Surgical Journal.*

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THE RESTORATION OF EXTREME SCOLIOSIS TO PERFECT SYMMETRY, WITH REPORT OF A CASE.*

BY WALTER G. ELMER, M.D.,

Instructor in Orthopedic Surgery in the University of Pennsylvania; Assistant Orthopedic Surgeon to the University Hospital, etc.

Marie W., a schoolgirl, was ten years old when I first saw her. She had been ill for thirteen weeks with typhoid fever, and had been up and about for only a few weeks. Undoubtedly she had had a curvature of the spine for a considerable time before her typhoid fever, for she presented one of the worst cases of scoliosis I have ever seen. The right costal margin rested upon the brim of the pelvis, the trunk was carried far to the left side of the median line and the child's body seemed hopelessly dwarfed and twisted. The diagram which I made and which is reproduced in Fig. 1 and also in Fig *7 a* shows a total left curve; the vertical distance from the vertebra prominens to the top of the sacrum is 12½ inches, the maximum deviation to the left of a plumb-line dropped from the vertebra prominens to the coccyx being 2 inches. The rotation of the spine was not very marked. When standing in the erect position the transposition of the trunk to the left made the right hip stand out very prominently, while the left flank was flush with the thigh. The left shoulder was raised high above the right. I looked upon the case as a hopeless deformity.

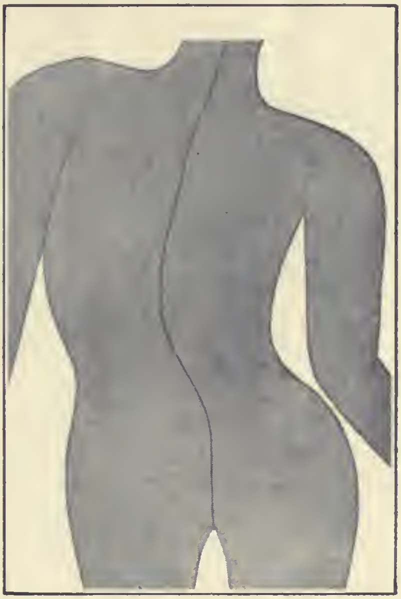

Fig. 1. Diagram to show curvature of spine and distortion of trunk of Marie W. when first seen.

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* This child was shown to the Pediatric Society in Philadelphia at the meeting in May, 1908.

In lifting the child by the head the spine straightened very considerably, and more so when the child was lying prone and extension made upon the head and lower limbs—a very hopeful sign. The spine flexed readily to the right with the curve, but very slightly to the left against the curve. The lower limbs were equal in length.

I shall give a detailed description of the treatment which I followed in this case, because the result is so perfect that it is worthy of consideration and there are many cases to which it is applicable.

The combined method of plaster of paris jackets and physical exercises was selected as promising the best results. It is very essential that in the application of the plaster jacket the child be lying prone and not suspended by the head in the usual manner. If the child be suspended the muscles remain tense, the normal lordosis becomes accentuated, the lateral curves persist because of the muscle tension, and there is not enough pull in the weight of the lower portion of the patient's body to properly straighten the spine. When the patient is lying prone upon a firm support the muscles relax, the lumbar lordosis is not marked, and when extension is applied to the head and feet the spine easily yields and stretches out into the straightest possible line. It is in this position, then, that the trunk should be firmly supported in a strong, closely-fitting plaster jacket.

I have had an apparatus constructed for this purpose in the University Hospital which enables the surgeon, with the assistance of a nurse, to put on just such a jacket quickly and easily.

The apparatus consists of the usual gas-pipe frame which we use for plaster jackets on our cases of tuberculosis of the spine. This frame at one end is hinged to the wall, so that it folds up against the wall when not in use. A strong muslin sling is stretched lengthwise along this frame. The muslin is folded into a band of four thicknesses of about eight inches in width, folded around the cross-bar next to the wall and pinned with a double row of large safety pins. The opposite end of the muslin band is wound around the windlass at the foot of the frame, and held tense when the windlass is wound up; thus we have provided a firm, flat surface for the child to lie upon just as she would lie upon a table.

The child's body is enclosed in stockinette stretched smoothly to avoid wrinkles, and enough left above and below to turn over the outside of the cast and completely cover it. The child is placed face downward upon the muslin support. The leather bridle adjusted and the rings hooked into strong hooks in the wall; the top of the head is then but a few inches from the wall. The patient's hands grasp the side rods close to the wall and leather foot pieces are buckled about the ankles. Into the iron rings attached to these a block and tackle is hooked, the other pulley being fastened to the opposite wall in a direct line with the patient's body. Because of the double pulleys a nurse can with almost no effort put a great amount of tension upon the child's body and maintain it for any length of time desired. The appliance must be used at first with great care in order not to put too great a strain upon the spine, for the apparatus is capable of such great power that it would not be difficult to actually tear the lateral ligaments on the contracted side. As the extension is applied the spine straightens out very markedly, the rotation noticably diminishes and the general axis of the child's body from the head to the feet is much improved.

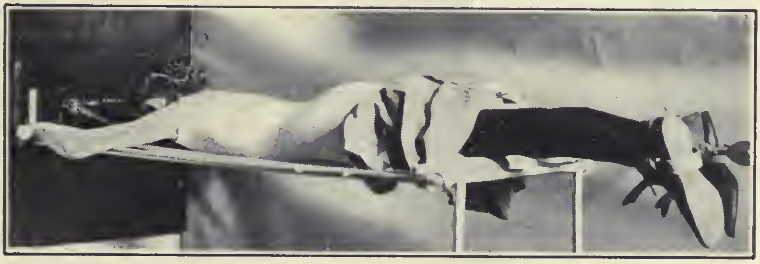

Fig. 2. Showing child lying on tightly stretched muslin strips ready for application of jacket.

A thin band of cotton is put about the brim of the pelvis to protect the iliac crests, and the circular turns of three inch plaster bandages are then applied from the arm-pits downward to the waist-line; and from an inch above the great trochanters upward to the waist-line overlapping the upper bandages. The bandages are applied in this manner until about ten have been used. The cast at its lower margin—or what is really its pelvic band—should be very strong and also that portion about the waist-line which is liable to break, for the greatest strain comes there. This pelvic band of plaster should encircle the pelvis widway between the great trochanter and the crest of the ileum. The upper portion of the cast should overlap the manubrium and reach to the spines of the scapulæ.

When the cast has hardened, which requires about ten minutes, the nurse removes the extension; and while she supports the child in her arms, the muslin band is cut across above and below, the bridle is removed and the child transferred to a couch. The

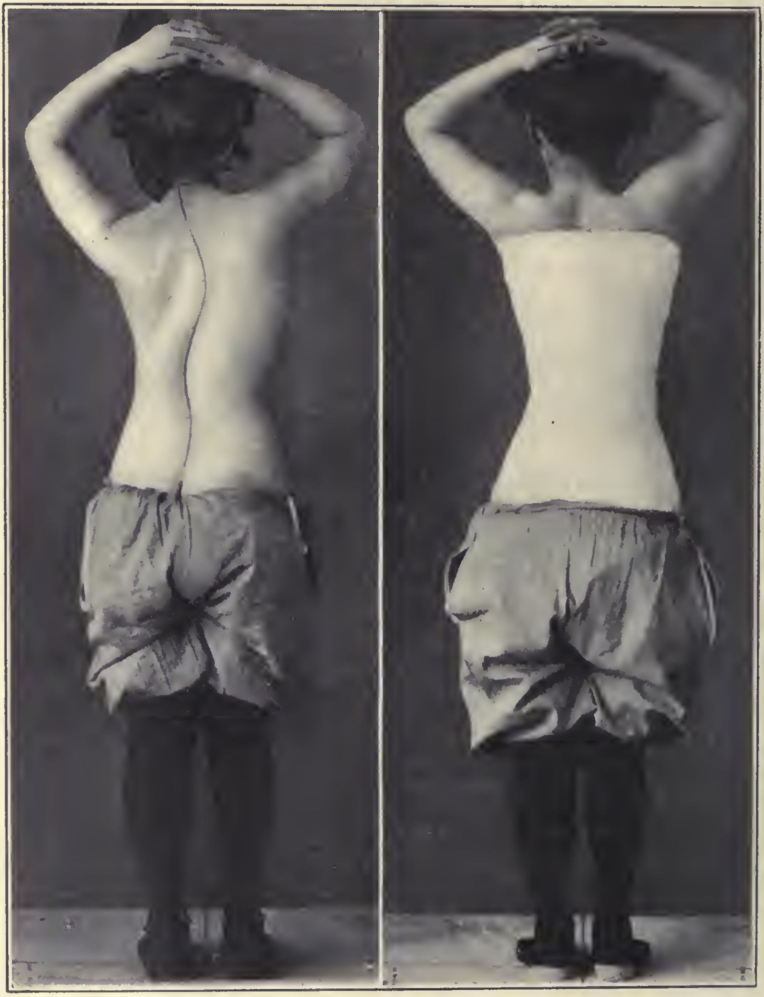

Fig. 3. Showing curvature in second case on beginning treatment. Compare right and left contour lines.

Fig. 4. Showing restoration of contour by plaster jacket.

jacket is now trimmed away a little under the arm-pits and at its lower margin in front to permit the thighs to flex to a right angle. It is then cut all the way down the mid-line in front and

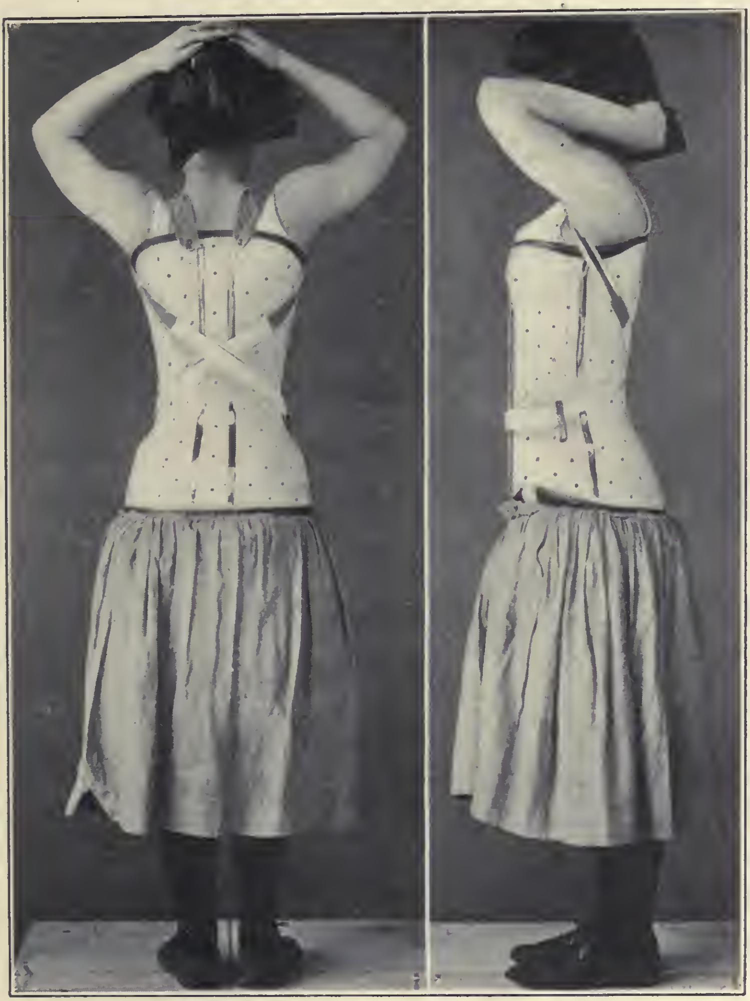

Fig. 5. Back view of leather jacket. Compare the lateral contour lines.

Fig. 6. Side view of leather jacket.

kept in place with a tight bandage. If the child now stands erect it will be seen that the trunk has had much of its symmetry restored. It is not unusual, in a case where the spine retains considerable mobility, to remove so much of the deformity that almost complete symmetry is obtained. I have increased the height of a child 1⅞ inches—the measurements being taken with the child standing before and after the jacket had been applied. As a rule, however, we reach our final results after a course of treatment extending over two or three months, in which quite a number of plaster jackets have been applied, each one showing some improvement over the previous one. Fig. 3 will illustrate this. It is the photograph of a child twelve years old, who was admitted to my service in the University Hospital in September, 1908. She presented an advanced right dorsal, left lumbar curve, with marked rotation. The ribs were thrown well backward on the right side and the left lumbar muscles stood out very prominently. By a succession of plaster jackets—a new one being put on every two weeks—we reached the symmetrical lines shown in Fig. 4, and the rotation has been completely overcome. At this stage a jacket was applied and at once removed to serve as a mould. It was filled with liquid plaster and a model of the child's body was obtained. A careful study of this model showed the symmetry to be almost perfect. The child had been receiving daily treatments in the gymnasium from the beginning and all the time we had been endeavoring to regain all of the lost mobility. A leather jacket was now molded upon the plaster model. When such a jacket is properly made it is the strongest, most durable and most comfortable support that can be obtained. This particular one weighs a little over three pounds, a pound and a half lighter than plaster. The child can put it on and remove it unassisted and it is practically indestructible. The jacket should, of course, always be laced on while the child is lying on her back. Fig. 5 shows the child standing with her jacket on. The jacket fits the body closely at every point, there are no dead spaces, and the contour of the jacket, therefore, gives you the contour of her figure. Fig. 6 shows a side view. I would call your attention to the vertical anterior line, which I consider so important. It is as though we had placed the child upon a flat table-top. There is not the hyperextension which we wish to obtain in the treatment of tuberculosis of the spine.

In two months' treatment we have increased the height of this patient two inches by actual measurement as she stands with her jacket on; we have stretched and overcome the contractures and restored the mobility of the spine; we have overcome the rotation and the lateral deviation, for the spine now is being maintained in a straight line. I presented this child to the Philadelphia Pediatric Society at the December meeting to illustrate some remarks on the "Application of Force in the Correction of Rotary Lateral Curvature." It is probable that she will wear her jacket for a year, and her treatment will extend over two years, before she can be completely cured.

Now let us return to the child who is the subject of this paper.

A drawing was made of her spine to serve as a permanent record. A convenient way to do this is to suspend a broad strap of adhesive plaster four inches wide from the vertebra prominens to the coccyx, and smooth it along the child's back until it is in contact throughout. With the fingers the tip of each spinous process is then felt through the plaster and marked with pen or pencil from the seventh cervical to the coccyx; this dotted line is then made a solid line, the plaster stripped off and attached to a strip of heavy paper or muslin, labeled, the important points marked and a straight line marked from the seventh cervical vertebra to the coccyx. This, then, is our permanent record, and these records should be made by the same person always. It does not show the rotation, nor does it give us any idea of the actual distortion of the spine because of rotation; but it *does* show the lateral deviation of the ridge of the spine, and if we make a drawing once a month we can readily determine by making a comparison whether our child is improving, growing worse, or remaining unchanged. In my experience in the treatment of the spines of children I have found that a spine under treatment is always changing—it rarely remains stationary, and then only in those cases of rigid incurable bone deformity.

If one wishes to make an outline drawing to show the rotation of the spine the method of the projected shadow will answer. The child bends forward until the back is horizontal, a candle on a table a few feet behind the child and on a level with the back; the projected shadow is then outlined on a piece of paper pinned to the wall at the child's head. Any improvement or any increase in the rotation will then become apparent in the series of drawings.

After a drawing was made from her spine, the child was placed upon the horizontal frame and while extension was applied the plaster jacket was put on. Every day she was brought to the gymnasium and the cast removed while she was lying down, her exercises were given to her while she was lying prone or supine upon the couch, the cast was then replaced and bandaged firmly in place before she was allowed to get up. This treatment was followed for two months and during that time the only occasions when she was allowed to be in the upright position without her cast was when I made the drawings of her spine. About once a month the plaster jacket was renewed.

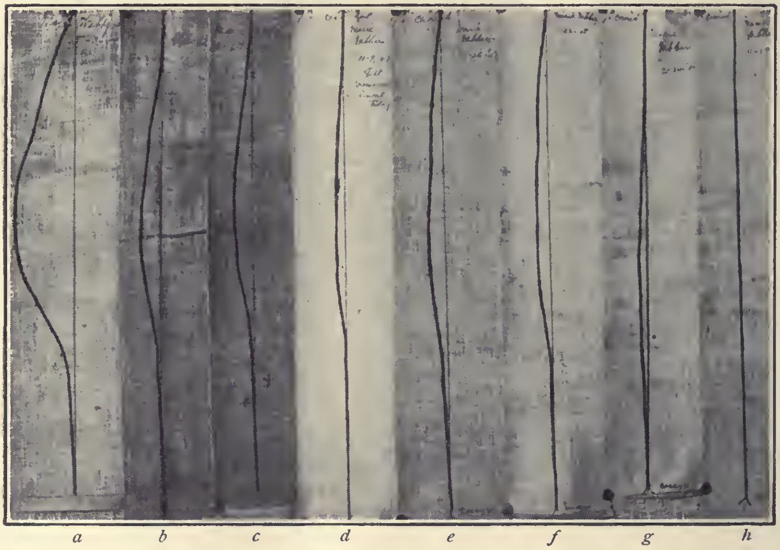

Fig. 7. Showing progressive correction of curvature of Marie W. under treatment.

After two months the patient began taking her exercises in the erect posture without her cast. Fig. 7 *b* shows the drawing made three weeks after the first, Fig. 7 *c* one month later, and Fig. 7 *d* six months after the first, when she was still wearing a plaster jacket. A gradual improvement will be noted through the series. The jacket was then discontinued, the patient having worn a plaster support from May 3 to November 8, 1907. She continued her daily exercises as usual, and on the 26th of November a drawing (Fig. 7 *e*) shows that the spine without its artificial support has relapsed. We had now to deal with a moderate total left curve in a growing child, who is growing stronger and harder every day from gymnastics and unilateral exercises. The problem presented at this stage was comparatively simple, and we persisted in our treatment by gymnastics alone. By the 22d of January, 1908, we had almost overcome what we had lost after removing the jacket (see Fig. 7 *f*), and by the 24th of February a drawing (Fig. 7 *g*) shows that the spine without its artificial support was steadily improving. Meanwhile our patient was growing and developing splendidly under our eyes—her muscles were becoming full and rounded and hard, her stature erect, her spine flexible and mobile in all directions, and she glowed with health. The last drawing (Fig. 7 *h*), made on the first of April, 1908, shows her spine to be perfectly straight, a plumb-line from the vertebra prominens to the coccyx shows not the slightest deviation. When she bent forward there was no rotation apparent, and her trunk, shoulders and hips were absolutely symmetrical, also. In fact, she was as perfectly formed and beautifully developed a girl as it would be possible to find. Fig. 8 is a photograph taken in November, 1908, one year from the time the jackets were given up. During this period she has had no artificial support whatever, and is coming to the gymnasium twice a week for general symmetrical exercises.

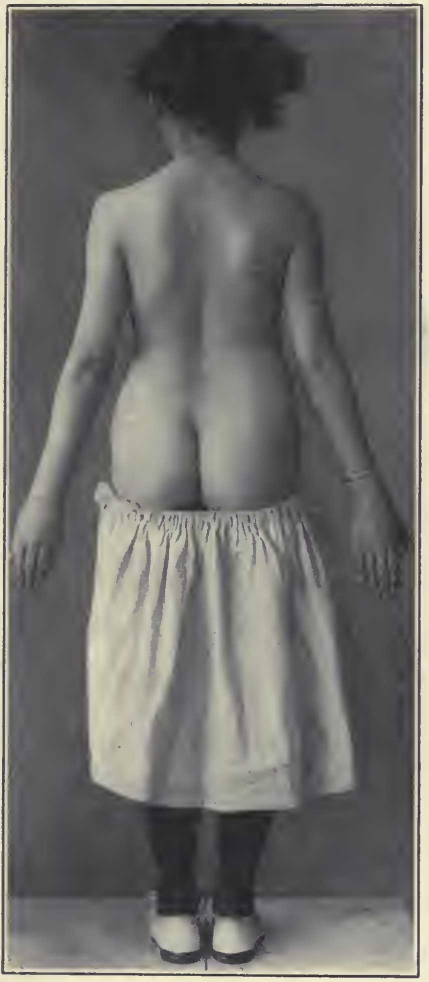

Fig. 8. Photograph of M. W., showing perfect symmetry.

We have obtained here a perfect result in a child who, without proper treatment, was destined to become helplessly dwarfed and twisted.

Now let us study the methods which were used in correcting this condition aside from the artificial support. In the first place we should have clearly in mind the indications which must be met and the difficulties to be overcome.

It has already been noted that the mobility of this child's spine was considerably impaired; that is, it would flex easily with the curve to the right, but almost not at all to the left. This limitation in the range of normal movement had permitted the muscles on the right side of the column to become weakened and atrophied from disuse and the ligaments shortened and contracted. The muscles on the left side of the spinal column had become overstretched and weakened, and no longer had the power to hold the column up straight, even if it were forcibly brought into a corrected position. These muscles were growing progressively weaker and more helpless and with all the natural mechanical forces working against nature the deformity must have increased constantly until the point of firm, bony rigidity was reached. In regard to the rotation, I have already said it was slight, and, in fact, just about commensurate with the physiological requirements of so abrupt a lateral curve as this child presented. For it must be remembered that if the spine of a healthy, well-developed child be flexed laterally the bodies of the vertebra rotate in the direction of the convexity—that is, the lateral cramping of the edges of the bodies in the concavity of the arc forces the bodies outward in order to gain for them more room. Therefore, in this child the rotation was to the left and the ribs were carried a little backwards on the left side and there was some fulness along the left lumbar muscles.

The first indication is to restore as completely as possible the normal mobility of the spine, for we can accomplish nothing while working on a rigid spine. The second indication is to retain the improvement in posture, which can be secured by a moderate amount of force correctly applied, *i.e.*, by means of a properly fitting plaster jacket. Third, by means of general and unilateral gymnastic exercises we endeavor to restore all the normal movements of the spine—stretch and strengthen the contracted muscles, protect and develop the overstretched and weakened muscles and so strengthen and toughen all the natural supports of the spine that they will be able to maintain it in correct line without artificial support; and the patient at the same time is being educated in the proper posture while sitting, standing and walking. It is by working on these principles that a perfect cure is to be obtained.

For about six weeks or two months the child is given her daily gymnastic treatment while lying prone or supine upon a couch, the plaster jacket having been removed for this purpose. The exercises last for about three-quarters of an hour with intervals of rest. A vigorous general massage is then given and the patient rests for a half hour longer. She is not allowed to sit up or stand without her cast during this entire period of two months unless for the purpose of making a diagram of her spine.

The exercises consist of general gymnastics which bring into action all the extensors, flexors, abductors, adductors, rotators, etc. These usual symmetrical exercises do not differ from those generally employed in calisthenics.

The unilateral exercises, however, are very important, and must be given correctly.

The *key-note position* which the child assumes while standing is the one which most nearly restores the symmetry of the figure. In the child under consideration the key-note is the *reverse* L—that is, the right arm vertical beside the head and the left arm extended horizontally outward from the shoulder. When the child stands erect in this position and puts all the muscles on the stretch, she is doing all she can toward restoring her symmetry in two ways. First, a direct muscular pull is exerted upon the spine by the muscles from the spine to the right scapula and from the spine to the arm itself, the rhomboid and trapezius and the latissimus dorsi muscles are all put upon the stretch by the vertical right arm. Second, the left arm extended horizontally from the shoulder acts as a lever which by its weight causes the trunk to shift its position to the right on the pelvis, thus, in a measure, acting to restore the general line or axis of the body. If the total curve were to the right, the L key-note would be prescribed. If the curve were double, usually we would prescribe the L key-note position for a right dorsal left lumbar curve and the reverse L for the left dorsal right lumbar. This frequently can only be correctly prescribed, however, by practically testing the different positions and noting the effect produced upon the spine and the contour of the body.

Our patient was now prescribed rotation movements to the left in addition to her general exercises. These unilateral exercises, known as the "Seal," are carried out with the child lying prone upon a firm couch. The nurse holds the ankles down firmly and the child, with the arms in the key-note position raises the body as high as possible from the couch by hyperextending the spine and then lowers it again. The movement is carried out slowly and repeated ten times. At first, some assistance must be given by the nurse, her hand under the upper chest. Gradually, as the muscles grow stronger, the child can easily carry out the exercise unassisted.

After a brief rest the child again raises her body from the couch, only the lower limbs and pelvis touching it, and while poised in air, the arms fully extended in the key-note position, the body is swept as far around to the left as possible, then back again to the mid-line and slowly down. The movement can be repeated ten times. This exercise flexes the spine against the curve, restores the normal mobility in lateral bending, causes the bodies of the vertebra to rotate from their faulty position over to the right and so restores the normal mobility as to rotation. It stretches the atrophied and contracted muscles of the concave side and strengthens and develops the overstretched and weakened muscles of the convex side of the spine.

The child is then pushed to the end of the couch and with the pelvis near the edge, the body dips far down over the end and is then raised by a broad sweep into the hyperextended position, the arms all the time key-note, and slowly repeated ten times. This is a very severe exercise, and cannot be attempted too early in the treatment. It develops powerfully the erector spinæ and lumbar muscles.

Exactly the reverse of this exercise may be done, the child lying in the supine position and with both hands holding one hand of the nurse. It develops chiefly the ilio-psoas and abdominal muscles and hyperextends the spine to its full limit.

After two months of this treatment the child is allowed to take her exercises in the upright position also, and she continues to wear her plaster jacket which is only removed for her exercises. She is now taught general symmetrical exercises in the upright position with light dumb-bells, Indian clubs, Sargent's chest weights or the Whitely exerciser, pulling the endless rope, climbing the ladder—the upper hand of the key-note always reaching up first to the round above and the other hand following—swinging the length of the gymnasium on the rings, swinging on the double trapeze, self-suspension by bridle and pulley, walking erect with the balance-board on the head, also with the English back-board, riding the lateral curvature bicycle, breathing exercises and the machines for forcible correction. Of these latter, we usually depend upon Weigel's and Beeley's, although there are other appliances used for the same purpose, as the fulcrum and the manual pressure-board. The unilateral exercises can only be of service of course in correcting a spine in which there still remains a good deal of mobility or in which we have been able to restore it by the use of these machines.

The most important unilateral movements in the upright position are these:—

The child stands erect, the nurse grasps and holds the pelvis firmly, the child with the arms in the key-note position, bends far forward until the body is horizontal, then twists the trunk as far around to the left as possible against the curve, then slowly back to the mid-line and up. This can be repeated ten times.

In the next movement the child inclines the body forward to about forty-five degrees, sweeps the trunk to the left in a broad arc upward and backward and once more into the upright position.

The third movement is somewhat similar, but the body is inclined but slightly forward, and then by a broad and steady sweep describes an arc to the left and backward into the position of hyperextension of the spine and then into the upright position. These movements repeated ten or more times daily and continued for months have a remarkable effect in restoring mobility, and especially the mobility of rotation, and the whole spine, as it grows straighter and straighter under our efforts, becomes supported and embedded in a tough dense mass of powerful muscles which have perfect control over the bony column.

Where we have to deal with the usual double curve, we select the more prominent one and direct our treatment chiefly to it. But not, however, to the neglect of the other curve. I usually prescribe two-thirds of the unilateral movements for the more prominent curve and one-third, in just the opposite direction, for the lesser curve.

There is a movement which has a very powerful effect upon the lumbar region. The child is placed upon the couch, lying on the side toward which the convexity of the lumbar spine looks. She is then supported by the nurse and moved well out over the end of the couch—the lower limbs held down firmly—and with one hand in that of the nurse, the body is flexed laterally far downward toward the floor, then up again. The hand of the lower arm can be placed behind the occiput. This brings all the weight and leverage of the body to bear upon the lumbar spine, flexing it against the curve. The movement should be repeated ten times.

There are a number of minor unilateral exercises which can be used to advantage, but lack of space prevents their enumeration here. There is one more movement, however, which should be described, and that is the *oblique step*.

The child assumes the erect position, the arms key-note. Then if we are dealing with a left lumbar or left total curve, the patient is to step obliquely forward to the left with the left foot, keeping the right foot and heel firmly on the floor. The left knee is then flexed as the pelvis moves far forward to the left over the flexed knee. The patient then bends the body as far forward and to the left as possible, then slowly returns to the upright position and steps back into the original position once more. This may be repeated from ten to twenty times. In certain cases the movement is balanced by giving two-thirds to one side and one-third to the opposite side. This exercise accomplishes several things—it tilts the pelvis downward on the side of the hyperextended thigh, for the transverse axis of the pelvis and the hyperextended and abducted thigh are brought nearly into line, thus correcting the lumbar curve, or even overcorrecting it, and by frequent repetitions doing much to restore the mobility. There is also a direct pull against the rotated vertebra by the psoas muscle, which is put upon the stretch by the hyperextended thigh, causing them to swing back to the mid-line, or even to the opposite side. And lastly, this movement, by the forward flexion of the trunk to the left, stretches the muscles of the concave side of the lumbar spine, forces the bodies of the vertebra to rotate to the opposite side, strengthens the muscles on the convex side and restores mobility.

This, then, embodies the principles of our treatment, and the work must be carried on patiently for months. The spine is corrected little by little by our fixed dressings applied under extension in the prone position until finally symmetry is obtained, and all the time we are working to restore mobility and strengthen all the natural supports of the spine in order to make our correction permanent and place the spine under the voluntary control of the patient. Our plaster and leather jackets are not only removing the mechanical forces which are always at work to make the child worse, but they are always holding the spine in its corrected position, and by means of its gentle pressure or corrective force it is encouraging the spine of the growing child to grow straight—just as the constant gentle pressure of bow-leg braces encourages the young and growing bone of the child to grow straighter.

The children should be kept under observation for a long time after they are believed to be cured, and my custom is to have them return to the gymnasium for exercises once a week for several years. In this way we are able to guard against the possibility of a relapse. It is of far greater consequence to the child than the taking of music or French lessons.

Every case of curvature, almost without exception, if seen early can be arrested and cured. In the cases of advanced rotation one cannot appreciate how great are the difficulties that must be overcome in restoring the child to symmetry unless he himself has been devoting much time and thought to this line of work. But there is no class of cases which can bring greater satisfaction to the surgeon. The bent and twisted body of a child restored once more to its natural lines and the beautiful and healthful growth and development which follow must always be a reminder to him of work accomplished which has really been worth while.

I wish to express my sincere appreciation of the skilful work and painstaking efforts of Miss Anna S. Kite, who is in charge of the Orthopedic Gymnasium in the University Hospital; and I am indebted to the Photographic Department of the hospital for taking for me the photographs from which these illustrations are made.

1801 Pine Street.

SCARLET FEVER CARRIERS.*

BY CHARLES HERRMAN, M.D.,
Attending Pediatrist to the Lebanon Hospital; Clinical Assistant in Pediatrics, Vanderbilt Clinic, New York.

We have just passed through what is probably the most severe and widespread epidemic of scarlet fever in the history of New York City. From January 1, 1908, to the present (June 1, 1908), 18,668 cases have been reported to the Department of Health. There have been 1,016 deaths, a mortality of 5.4 per cent. Chart 1 shows the number of cases reported and number of deaths by week from January 1 to June 1, 1908. I am unable to explain the peculiar remittent character of the mortality curve. That this is not present in all epidemics is shown by the mortality curve of the epidemic of 1901. Although the curve is irregular, it does not show such marked remissions.

Never before have the cases been recognized so early, reported so regularly or isolated so carefully as during this epidemic. All the children of the family in which a case occurred have been kept from school. The premises have been disinfected. A new pavilion for scarlet fever patients has been opened and a large number of cases have been removed from their homes where they may have been a source of danger to others. Making due allowance for the increase in population and more regular reporting of cases, it may be safely stated that the number of persons infected has not diminished markedly as against previous years. Why is this? There must be some weak link in the chain. There must be some source of infection which has been overlooked, or which at least has not been given due consideration.

The schools have often been held responsible for the spread of this disease. In some epidemics, and in some localities, this has undoubtedly been the case. However, from my own observations, I do not think the schools have been an important factor in the present epidemic in New York City. Except in rare instances all the children of a family in which a case occurs are kept from school. Mothers have learned to keep their children at home if they complain of not feeling well. Most of the school teachers recognize the fact that a child is not well, and send it to the school physician for examination. During the last eight months

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* Read before the Medical Society of the Borough of the Bronx, June 10, 1908.

I have seen all the cases which occurred in a district of thirty-six square blocks. The children attended principally two public schools located in the district. From January 1, 1908, to June 1, 1908, there occurred 96 cases in eighty-three families. In only three instances* did 2 cases occur within one week in one class room, and in no instance were there more than two.

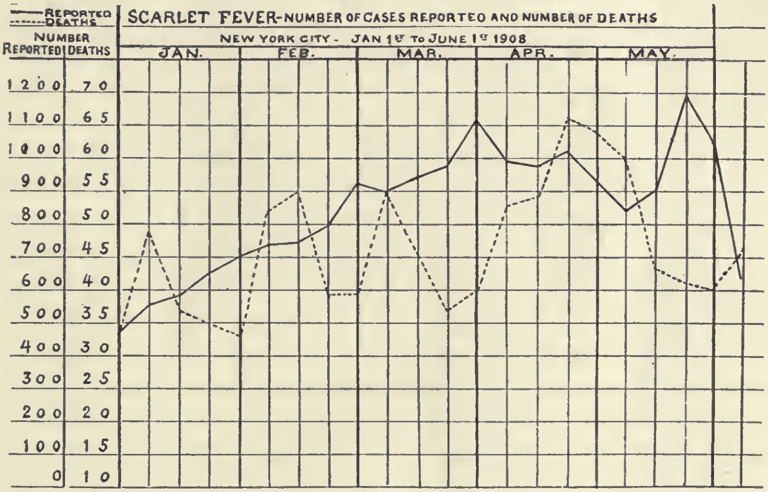

Chart 1.

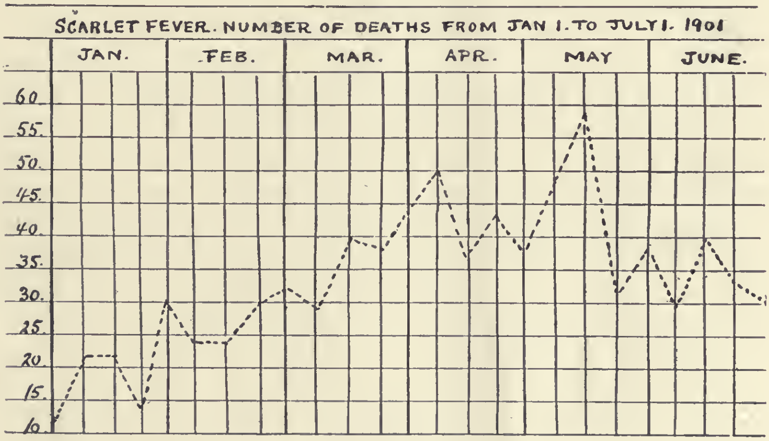

Chart 2. Mortality curve of epidemic of 1907.

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* The cases occurred March 7th and 8th. March 23d and 28th. April 10th and 16th.

How does scarlet fever spread? Much stress has been laid upon the desquamating scales of the skin as a source of infection. According to most text-books it is a very important if not the most important factor in the spread of the disease. Although it is stated that the discharge from the nose and throat may transmit the disease, it is spoken of as communicable as long as any desquamation exists. Practically the case is considered terminated when all signs of desquamation have disappeared and not till then. In this way unconsciously and involuntarily, the idea has been spread that the scales thrown off from the surface of the skin are the chief carriers of the infectious material. What positive evidence have we that such is the case? We have records of only two or three inoculation experiments with no details and all performed many years ago. According to Guersant, Petit-Radel made an unsuccessful attempt to inoculate scarlet fever by introducing the scales of epidermis under the skin. Stoll is said to have successfully inoculated a patient in this way, but we have nothing more than the mere mention of the fact.

Let us examine more carefully one way in which the scales have been supposed to act as carriers of the infection; namely, in letters sent to the persons infected.

Richardson[1] says, "I know for instance of a well authenticated case in which the disease was conveyed into the family of a medical man by the mere transmission of a letter from the house of a friend many miles distant, in which one of the inmates was suffering from the disorder. The infected letter was unhappily seized by the child of the medical man, and was conveyed by her to her mamma. Both were susceptible, both contracted the disease, and both died of it." The author does not state whether there were other cases in the neighborhood at the time. It is not impossible that the father, a medical man, may have acted as the carrier of the infection.

Peterson[2]. "A young girl contracted scarlet fever. As far as it was possible to ascertain she was not infected by anyone around her. She had corresponded with a friend who lived at some distance. This friend had had scarlet fever one month previous, and during the period of desquamation had written her several letters. Peterson thinks it not improbable that a few small scales, perhaps microscopic, were rubbed off the hands while writing and these infected the recipient of the letters.

Sanné.[3] In August, 1877, a widow and her daughter who were in Bretagne, received a letter from the daughter's former governess who was then living in Germany. She wrote that she was convalescing from scarlet fever, and that the desquamation was so marked that while writing it was necessary to shake the scales from the paper several times. A few days after receiving the letter, the mother and daughter were attacked with scarlet fever, the mother died and the daughter barely escaped death. Admitting that the letter did carry the infectious material, it is possible that it was deposited in the letter in blowing off the scales, droplets of saliva acting as the carriers, or in licking the envelope or stamp. The saliva is far more likely to contain the infecting organism than the desquamating epidermis.

It is interesting to hear what some of the highest authorities say on the subject.

Thomas.[4] "The contagiousness of the past exanthematous period is usually ascribed to the scales of epidermis which separate during the process of desquamation; but it seems to me that there is not the shadow of evidence to prove that the contagion is contained in them, either exclusively or even chiefly."

Heubner.[5] "The desquamation of the epidermis during convalescence is usually looked upon as a sign of danger of infection still present, and the scales are considered carriers of the contagious material. But this supposition is by no means proved. It is just as likely that the infectious material is present in the throat, in the discharge from the ear, in the urine, or in the other excretions."

In other words the patient may harbor the infectious material during desquamation but not necessarily in the scales of separating epidermis. He may also be a source of danger long after all signs of desquamation have disappeared.

From personal observation I believe that the desquamation is an unimportant factor in the spread of the disease. This opinion is based upon the fact that in the tenements I have repeatedly seen the children of a family playing with a patient showing marked desquamation and they did not contract the disease. In the vast majority of the cases scarlet fever is contracted from a patient in the first stage before there is any desquamation. In the so-called "return cases" the patient does not leave the hospital until all traces of desquamation have disappeared, so that in these the separating scales cannot be the causative agent.

Infected rooms. The following case described by Richardson[1] is frequently cited as an example of the tenacity with which the contagious material of scarlet fever may cling to the room in which a patient with that disease has been treated. A couple with four children occupied a cottage in the country. One child had a severe attack of scarlet fever and died. The remaining children had been immediately sent to another village several miles away, but after a few weeks one of them was allowed to return. In twenty-four hours it had a severe attack of scarlet fever and died like the first child. The cottage was then thoroughly cleaned, the walls repainted, *the floors scoured,* and all the linen and clothing washed or destroyed. After an interval of four months the third child was allowed to return and like the previous two was attacked and died. Richardson says: "I have always believed that in this instance the thatched roof was the medium in which the poison was retained."

Jurgensen, in citing this case, thinks it more probable that the floor retained the contagious material. However, it is distinctly stated in the original that the floors were scoured. The author does not mention the possibility that the father, mother or servant may have had a mild form of the disease, perhaps simply an angina and in that way may have acted as a scarlet fever carrier.

In this connection a quotation from Murchison[6] is interesting. This was written in 1864. "The mildest cases appear as capable of propagating the disease as the most severe. From this fact a most important consideration arises in reference to the prognosis of scarlet fever. It is well known that adults exposed to the poison of scarlet fever whether protected by a previous attack of the disease or not, are liable to suffer from sore throat with or without fever, but with no eruption, from time to time, on the occasion of such exposure. It is less generally known however, although in my opinion no less true that persons suffering from this sore throat are capable of imparting scarlet fever in its virulent form to unprotected children. Several observations of a most unmistakable nature have led me to this opinion which if true obviously demands serious attention." And Heubner. "It is supposed that the poison may remain in rooms, on the walls and floors even after thorough disinfection. This is based on the cases in which healthy members of the family have been sent away from home, and on their return to the carefully cleansed rooms have been taken sick. But there is still another possibility, namely that the poison is still present in the patient who is apparently well, or perhaps in the nurse or parents who have had a very mild attack." And again, "It is most frequently the mild cases or those not yet seriously ill which infect others, and the most dangerous carriers are those adults whose illness consists solely in an angina often not even accompanied by fever."

Some interesting observations bearing upon this point have recently been published by Thornton.[7, 8] In 1903 a number of cases of scarlet fever occurred in an English school of which he had charge. There were 96 in all. Of these 31 showed a typical rash, sore throat and pyrexia; 19 had no rash and only a slight sore throat with pyrexia, the remaining 46 had no noticeable symptoms but desquamated. In 1907, 2 cases of scarlet fever occurred in the same school. The temperature of the remaining 299 pupils was taken regularly, and of these 131 had a temperature of from 99° to 100° F. for two or three days; 29 or 10 per cent. had 100° to 101° F. In a few days the temperature of all returned to the normal. There were no other symptoms and no desquamation. Of the 131, 23 had had an attack of scarlet fever previously.

During the last five months in the district already mentioned, I have had an opportunity of studying the manner in which the disease is most frequently spread. From January 1, to June 1, 1908, there occurred 96 cases of scarlet fever in eighty-three families; seventy-six other children in these families were more or less exposed and did not contract the disease. Of these sixteen had already had an attack. This is in striking contrast to measles, in which excepting infants under five months and children protected by a previous attack about 99 per cent. contract the disease.

In three families the mother who nursed the patient had a sore throat, some rise of temperature and slight malaise without any rash. They occurred as follows:—

1. Child taken sick on April 4th. Mother April 27th to May 1st.
2. Child taken sick on April 27th. Mother April 30th to May 3d.
3. Child taken sick on May 18th. Mother May 22d to May 27th.

Several years ago I saw a case in which the patient was carefully isolated and nursed by the mother. One week later she had a sore throat for several days but continued to nurse the child. Four or five days afterwards two other children of the family were attacked with scarlet fever. I have no doubt that in this case the mother was the carrier of the infectious material, not on her clothes or hands, but in her throat. The following case although not conclusive illustrates the same point. A family consisting of grandmother, father, mother and three children occupied rooms on the top floor of a large office building on Broadway. The children did not attend school; there were no other cases of scarlet fever in the neighborhood at the time, and no other children in the building or in the immediate vicinity. One of the children was attacked with scarlet fever. She was carefully isolated and nursed by the mother, a very intelligent woman, who took all the precautions advised in the "circular of information." She wore a gown while in the sick room; washed her hands after handling the patient or the soiled linen; the patient had separate eating utensils, etc. The food was prepared by the grandmother who also took care of the other two children, but the mother saw them for a few minutes each day. Two weeks after the first case these two children were attacked and one died.

The following table shows a series of secondary cases which occurred in other families of the same tenement.

	First Case.	No. Child Family.	Second Case.	Third Case.	
1.	Jan. 25	7	Jan. 31		same house
2.	Feb. 19	2	Feb. 26		" "
3.	" 23	3	" 28		adjoining house
4.	Mar. 2	3	Mar. 12	Mar. 23	same house
5.	" 21	6	Apr. 1		" "
6.	" 25	2	" 1		adjoining house
7.	May 11	2	May 18	May 26	same house
			" 18		" "
			" 19		" "

In those cases in which the interval between the primary and secondary cases was a week or less the infection was probably direct. In the remaining it was probably indirect, being carried by one of the children of the infector's family playing with the infected child, for in all the cases cited the children of the same or adjoining tenements were playmates. Very recently I saw a series of cases of scarlet fever in four families living in the same tenement, which illustrates one way in which the contagion is frequently carried. On May 11th, a girl of twelve was taken sick with fever, vomiting and sore throat. The attending physician made a diagnosis of tonsillitis. Evidently there was no distinct rash at that time. The child was not isolated and came in contact with the other children of the house. On June 1st she showed distinct desquamation of the hands and feet. On May 17th her sister, a girl of eight, had a similar attack. Cases of scarlet fever occurred in three other families of the same tenement as follows:

May 18. A boy of ten years.
May 18. A girl of four years.
May 19. A girl of two years.
May 26. A boy of eight years.

Had the first case been properly diagnosed and isolated, the other five could probably have been prevented.

A study of the so-called "return cases"[9, 10, 11] will give us valuable information with regard to another set of scarlet fever carriers. Patients who have been kept in the hospital for six or more weeks, after they are apparently well and all traces of desquamation have disappeared, return home and infect other children. How? It is pretty generally agreed that a discharge from the nose or ear was the causative agent. This discharge was present at the time of leaving the hospital or had disappeared at that time and had reappeared later. This is certainly the most rational explanation. I have repeatedly found the Klebs-Löeffler bacillus in the throat and nose eight and ten weeks after the diphtheritic membrane had entirely disappeared, especially in children with adenoids and hypertrophied tonsils, and this notwithstanding the fact that the parts were regularly sprayed or douched. There is also nothing improbable in the idea that the organisms which lie dormant may under certain favorable conditions increase in number and virulence. In this way persons might carry infectious material in their nose and throat for months. In these cases in which there is involvement of the middle ear, this part may act as a receptable or storehouse, and just as in typhoid fever the gall bladder may retain and discharge typhoid bacilli into the intestine, so the infectious material of scarlet fever may be discharged at intervals into the nasopharynx through the eustachian tube. The contagious material there, others may be infected in the act of talking, coughing or sneezing.

In 832 cases of scarlet fever observed by Barlow,[12] 40 had rhinorrhea alone; 85 rhinorrhea and otorrhea; 79 otorrhea in one ear; 56 otorrhea in both ears; that is, 258 or 31 per cent. had a discharge from the ears or nose or both. Of these 258, 15 had a discharge from the ears when they left the hospital, and Barlow believes that these caused the return cases; in fact in several instances he was able to prophesy that they would.

Barlow has also called attention to the fact that in hospitals the patients should be separated into three groups; first, the new cases; second, the cases with complications; and third, the convalescent cases. If the last group are kept in the same ward with the new cases they are constantly exposed to fresh infectious material, and though they may have no recurrence of the disease themselves, they may harbor the poison in their nose and throat and carry it home to infect others.

The Health Department has recently adopted the following regulations. In those cases which have been reported as diphtheria, and where examination of the culture has shown the absence of Klebs-Löeffler bacilli, the patients are examined at the end of three weeks by a medical inspector, to see if any desquamation is present. In this way a number of cases of scarlet fever have been detected, which otherwise would have been unrecognized and served perhaps as scarlet fever carriers.

During an epidemic all cases no matter how mild or doubtful should be isolated. The regulation that all children in a family in which a case occurs should not be admitted to school, should be rigidly enforced. These children should not be allowed to play on the streets with others. If the rooms are properly ventilated this is not such a hardship. In many cases the yard or roof may be used. The attending physician can help very much in the enforcement of such regulations. When a case occurs he should watch closely all the members of the family, adults as well as children. A slight rise of temperature, malaise, or sore throat should be treated as a mild attack of scarlet fever. During the first week if possible the temperature of every member of the family should be taken and the throat examined.

The large placards of the Department have been of very great value. Mothers are careful to prevent their children from mingling with those of the family in which a case has occurred, and they also help the Department in reporting violations of the regulations in regard to isolation.

Special attention should be given to nasal and oral hygiene. Adenoids, tonsils and carious teeth should be removed or treated. This renders the child less susceptible to infection, and if infected it is less likely to have serious complications, such as ulcerative stomatitis, and otitis.

Open wounds should be carefully covered, and such patients should be especially protected from contact with persons exposed to the disease. During the last four months I have seen 6 cases of scarlet fever occurring in children who were convalescing from surgical operations.[13]

Less emphasis should be placed on desquamation as a source of infection and more on the secretions of the nose, throat and ears. No case should be considered free from danger to others until these parts are in a healthy condition. Barlow recommends regular cleansing and the use of the "Formamint" lozenge. Patients should not be discharged from the hospital until these parts are in a perfectly normal state. In times of an epidemic with much overcrowding this may occur. The convalescent cases should be separated from the new cases.

On the question of *disinfection* I cannot do better than to quote Heubner.[5] "We must admit that there is no conclusive evidence that the contagious material of scarlet fever exists in a viable condition in the sick room. In most cases there is also the possibility, that the poison which has shown itself still infectious after the termination of the disease, may be present in the mouths of persons who were in attendance on the patient. Notwithstanding the fact that disinfection may be an unnecessary procedure it cannot be dispensed with in the present state of our incomplete and uncertain knowledge of the character of the scarlet fever poison."

250 West Eighty-eighth Street.

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CLINICAL MEMORANDA.

A CASE OF SCARLET FEVER WITH COMPLICATIONS, ASSOCIATED WITH CHICKENPOX AND WHOOPING-COUGH.

BY H. M. McCLANAHAN, A.M., M.D.,
Professor of Pediatrics, Medical Department, University of Nebraska, Omaha, Neb.

The following report presents several interesting features. The occurrence of three contagious diseases in the same individual all within a period of two weeks is, in my experience, unique.

General Remarks.—Family consists of father, mother and four children aged respectively fourteen, six, three and one-half and an infant at the breast nine months old, living in a small house of three rooms. The rooms are arranged in a row, with only one outside door, that leading into the kitchen. Adjoining this room is the bed-room and beyond the bed-room is the family sitting room. The bed-room being between the living room and kitchen made isolation of the case impossible.

The father remained away from home for four weeks on account of the nature of his work. The care of the children devolved entirely upon the mother and the boy of fourteen. The two older children had scarlet fever five years previously under my personal care. They had been attending school until a few days before I was called. Seven days previous to my being called to the house the two older children had varicella and when I saw them seven days after the development of the eruption there were yet remaining a number of reddish-brown scales on the face and body. An examination of these children, with a careful inquiry into the history of the cases, mode of onset, absence of prodromal symptoms, satisfied me that they were really cases of varicella.

On February 16, 1908, Martha, aged three and one-half years, was taken sick with vomiting and high fever. On the morning of February 17th, the child still having fever, I was called. An examination revealed the following: Temperature, 104°F., pulse 120, tongue covered with a white coat with red swollen papillæ visible through the fur. Entire pharynx red. Tonsils covered with a thick white exudate. Covering the body, upper arms and upper thighs was a bright erythematous rash with many minute puncta of a deeper scarlet color. The diagnosis of scarlet fever of a severe type was easily made. During the next five days the temperature at my visits ranged from 103° to 105° (temperature not taken during the interval). The cervical glands gradually became greatly enlarged. The rash extended entirely over both upper and lower extremities. On the third day the membrane in the throat extended over the tonsils and the lateral and posterior walls of the pharynx. A culture made on the third day was negative as to the presence of diphtheria bacilli.

An examination of the urine on the third day showed a slight trace of albumin, no casts, and was voided freely. Bowels moved daily. There was complete anorexia, but the child was persuaded to drink a considerable quantity of water. On the sixth day of the scarlet fever, while the rash was yet quite distinct, there developed varicella. The papules, rapidly followed by vesicles, came out in a succession of crops for three days, very profuse over the body, extremities and scalp; also three or four in the mouth and one upon the conjunctiva at the inner canthus of the left eye. On the same day the baby of seven months developed varicella. In both cases the disease followed the usual course. In Martha's case it was wholly uninfluenced by the pre-existing scarlet fever. During the second week of the scarlet fever the temperature fell gradually, ranging from 101°F. to 102°F. at the time of my visits. The membranous exudate in the throat cleared up also, but left the mucous membrane of the entire pharynx deeply red and edematous. The entire chain of cervical glands remained large, however, looking like a collar around the neck.

The beginning of the third week this patient developed a severe paroxysmal cough, as did also the child aged six years, and the baby of seven months, and in about ten days this cough became characteristic of true whooping-cough in the case of the infant, the little girl, and the scarlet fever patient. At the end of the fourth week of the scarlet fever, Martha was whooping severely, the paroxysms averaging about thirty a day, as recorded by the mother. After nearly every paroxysm she would vomit. The paroxysmal stage lasted just four weeks, so that at the end of eight weeks from the time she contracted scarlet fever, she was extremely emaciated. I have seldom ever seen greater emaciation. This I attribute to the whooping-cough. She was given milk to drink immediately after each paroxysm and for some time she had two normal saline injections by the bowel each day.

On the eleventh day of the scarlet fever and the fourth day of the varicella I discovered a slight swelling back of the left ear. Two days later there was evident fluctuation, although no discharge from the external meatus. After spraying the surface with ethyl chlorid—I made a free incision over the mastoid two inches long followed by a free discharge of pus. I did not attempt to curet the mastoid cells, but packed the wound with gauze and changed the dressing daily after washing with hydrogen peroxide. The following day there was a free discharge of pus from the ear. The incision practically closed within a few days, excepting that there yet remains a small sinus just behind the external ear. On the day following the discovery of the swelling over the mastoid, there developed a complete paralysis of the left side of the face. After the incision the paralysis rapidly improved and within a period of ten days that side of the face seemed as mobile as the other. I am satisfied that the paralysis was due to pressure on the seventh nerve trunk in the aqueductus Fallopii and not to pressure after it emerged from the stylo-mastoid foramen, for when the pressure was removed by the discharge of pus from the tympanic cavity, the function of the nerve was rapidly restored.

During the third and fourth weeks desquamation progressed rapidly and was very profuse, the skin over the abdomen coming off in great flakes. Four separate analyses of the urine were made during the four or five weeks of her sickness and excepting the first there was no albumin. After the subsidence of the whooping-cough paroxysms—namely in the eighth week of the disease—the patient improved rapidly in weight and in strength. Her appetite was voracious. With the exception of the discharge from the left ear and the sinus back of the ear the child is now in excellent health. During the eight weeks of her severe illness she grew in height, although emaciation was extreme.

Remarks.—The period of incubation of scarlet fever is from two to seven days. Varicella, fourteen to sixteen days. Whooping-cough, fourteen to seventeen days. The child contracted the varicella evidently from her brother and sister and the rash developed just sixteen days after it had appeared in the older children. The patient, the girl of six years, and the nursing baby evidently were exposed to the whooping-cough at the same time, as all three developed a cough almost simultaneously. An interesting fact is that the baby, aged seven months, was intimately and frequently exposed to scarlet fever, often remaining on the bed with the little girl and yet she escaped it entirely. This is in accordance with the statement made by many authors that nursing babies are generally immune to scarlet fever, and corresponds to my own personal experience. It seems conclusive to me that Martha had in her system at the same time the virus of scarlet fever, varicella and whooping-cough, and that each disease followed its regular course unmodified by the other. I have seen scarlet fever associated with varicella, and I have known of whooping-cough complicating scarlet fever, but I have never before seen the three diseases associated in the same patient at the same time. I have not had time to look up the authorities as carefully as might be desired, but the following quotations are made to show that it is possible for more than one contagious disease to be present in the same individual at the same time.

Dr. B. Schick, of Vienna, in his article in Pfaundler and Schlossman's "Diseases of Children," edited by Shaw and La Fétra says: "The view of Hebra, that the acute exanthemata mutually exclude one another, has been recognized as untrue for forty years, as a result of a large number of observations. All sorts of combinations occur between scarlet fever, chicken-pox, measles and vaccinia. These combinations are of clinical interest only when the rashes appear simultaneously. The diagnosis of varicella with scarlet fever does not present any difficulties."

William Thomas Corlett, M.D., in his book of "The Exanthemata," says: "It has been well established by a large number of carefully reported cases that the existence of scarlet fever in an individual does not prevent a secondary infection with any of the other acute exanthemata, such as measles, chicken-pox or smallpox, although it must be acknowledged that this is exceedingly infrequent. Murchison, however, has well emphasized the fact that, when two exanthemata coexist, one is usually mild and more or less ill-defined."

468 Brandeis Building.

SCARLET FEVER FROM A WOUND IN THE FOOT.

BY FRANK VAN DER BOGERT, M.D.,
Schenectady, N. Y.

Inasmuch as cases of scarlet fever in which the mode of entrance of the infecting agent occurs through a wound accidentally inflicted are comparatively rare, I feel justified in reporting the following case.

The patient, a boy aged five years, was injured on July 2d by stepping upon a "rusty" nail. The wound, according to the history given by the grandmother, healed quickly under treatment with salt pork, and in about two weeks the child was again running about in his bare feet.

On the evening of July 18th the child was brought to my office, it having been noticed at about noon on that day that the site of the injury had become inflamed. He complained also of pain in the left groin (the side corresponding to the injury). Examination showed the wound to be inflamed, surrounded by scarlet areola, with scarlet lines running from it two or three inches up the inner side of the foot. An inguinal gland on the side of the injury was enlarged.

The wound was dressed with a wet antiseptic pack, and the patient sent home and advised to remain in bed to keep the part at rest.

On July 20th a typical scarlet fever rash had developed together with a strawberry tongue, with a thick, white coat at center, congested tonsils, swollen and streaked with a yellowish-brown membrane, a culture from which showed no diphtheria bacilli. At this time an inguinal gland on the opposite side was found to be enlarged. The temperature was a little over 104°F., and the pulse rapid.

On the 21st the urine was examined for the first time, and showed a faint trace of albumin. The use of a spoon as a tongue depressor, in examining the throat, caused some bleeding from the pharynx, and was followed by an epistaxis.

On the 22d the tonsils were covered with a heavy, white membrane extending upon the uvula, which, with the surrounding parts, was markedly edematous. The glands at the angles of both jaws were much swollen. The temperature on the morning of the 22d was about 102°F., the pulse 140, showing the disproportion of scarlet fever. The general condition was good, the patient was hungry but unable to take food comfortably on account of the congestion of the throat. In fact, at no time was the patient's condition apparently serious.

Pus taken from the foot on July 23d showed a pure culture of streptococci, and a culture from the throat, taken a day later, also showed streptococci (examined by W. B. Stone). A specimen of urine examined on the 25th showed no albumin.

The diagnosis of scarlet fever was confirmed on July 25th by the development of the disease in a younger sister living in the same house, and further by the development of desquamation, which began on July 30th and continued for thirty-five to forty-two days. The desquamation was branny in character over the body, occurring in larger pieces over hands and feet.

Since the time elapsing between the date of the original injury and that of the development of the symptoms was long (18 days), and since the incubation period in these surgical cases has been, as a rule, short, the wound in this case probably became infected at some time between the date of the child's resuming his habit of going about bare-foot and the date upon which he was brought to my office, *i.e.*, between the 16th and 18th of July, thus making the incubation period from two to four days.

That the virus entered the body at the point of injury is, I think, proven by the pure culture of streptococci obtained from the wound, and by the enlargement of the inguinal glands which we would not expect had the scarlet fever followed the usual course and been merely a coincidence.

111 Union Street.

COMPOSITION OF LARGE CURDS IN INFANTS' STOOLS.—In the *Boston Medical and Surgical Journal* of June 11, 1908, Talbot states large curds in infants' stools are composed of some proteid (probably casein or one of its derivatives), which on coagulating entangles the milk fat in its meshes. The amount of fat in the curds depends on the amount of fat in the milk, and as this fat increases it replaces the proteid in the curd. The presence of large curds, which has been taken by some investigators to indicate an increase of gastric HCl, can with as great probability be interpreted as indicating a lack of HCl.—*Therapeutic Gazette.*

A CASE OF SCURVY, WITH X-RAY PLATES.

BY E. A. RIESENFELD, M.D.,
New York.

The case in question was admitted to Dr. Schwarz's department of the Mt. Sinai Hospital dispensary, on August 21, 1908. The patient, aged ten months, was a full term baby, normal labor. For the past six weeks the mother has noticed that the child was very restless and cries almost continually when the lower extremities were handled. She noticed also that the child was unable to sit without support or hold up its head.

Child was breast-fed for the first three weeks only, then put upon a mixture of milk, 2 ounces, and water 5 ounces, this amount given every two or three hours. After the first three months, 3 drams of a patent food to 8 ounces of water was also given to the baby twice a day. During the last two or three months the milk was discontinued entirely and the child given 5 drams of the patent food to 8 ounces of water two to three times a day.

Physical examination showed a fairly good general condition. Child rather apathetic; limbs entirely relaxed; excessively tender; baby screams whenever they are touched. Oral cavity negative. No hemorrhage into the gums. Baby has no teeth. Liver and spleen both palpable. Child was put upon a raw milk mixture with the addition of fruit juices and rapidly improved. After twenty days' treatment the tenderness of the limbs had almost disappeared. Weight increased from 14 pounds on admission to 18 pounds 5 ounces in November. When last seen patient was entirely well.

In those cases of Barlow's disease wherein many of the cardinal symptoms are not present or are only very obscure, we have in the X-ray a valuable aid to diagnosis. The X-ray plate of a case of Barlow's disease reveals to us two important conditions, namely subperiosteal hemorrhages, and changes at the epiphyseal line. The subperiosteal hemorrhages are not found in this disease alone, nor are they always found in Barlow's disease. Consequently their presence or absence is of little diagnostic value.

Of more importance and characteristic of this disease alone is the horizontal, irregular shadow seen at the epiphyseal line.

giving to the end of the shaft a distinctly hammered out appearance.

This, pathologically, is due to a broadening of the prolifera-

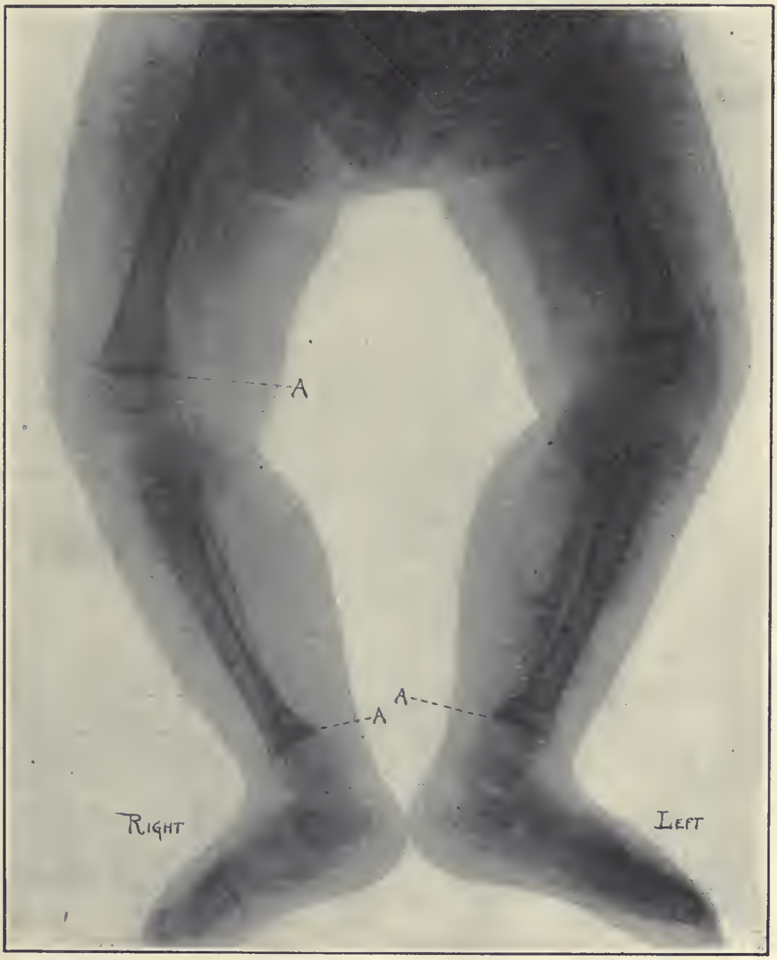

FIG. 1. A. Shows marked thickening and hammered out appearance of the epiphyseal lines. The only evidence of hemorrhage is seen at the inner surface of the lower one-third of the left femur. Excessive tenderness of all joints with swelling.

tion zone, below which is a zone of calcification abnormally narrow and converted, by excessive bony absorption and crowding in of marrow tissue, into small closely-crowded bony trabeculæ (Schmorl).

I am indebted to Dr. Jakes, of the hospital, for the pictures which were taken about every ten days, and which show very well the hemorrhages and the hammered out appearance at the epiphyses. Curiously, many cases which show no more symptoms of Barlow's disease, will frequently show by the X-ray that the bone changes are still present, often persisting for many months.

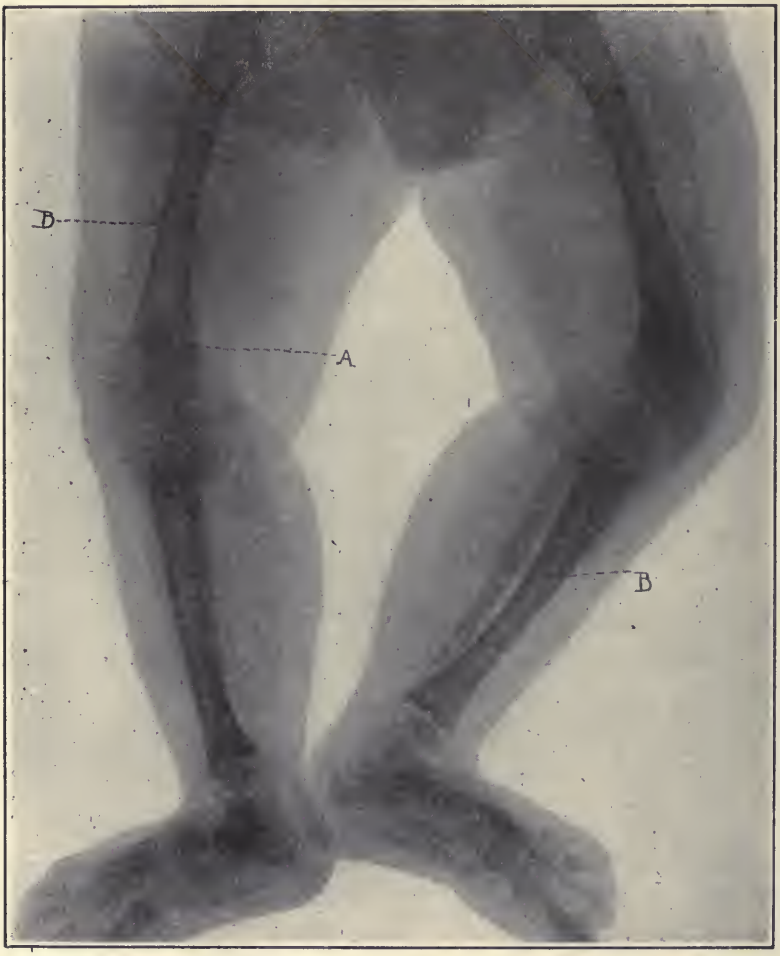

FIG. 2. After seven days' treatment. A. Shows that epiphyseal line shadow has faded out somewhat. B.B. Show evidence of hemorrhage at femur and tibia.

152 West 88th Street.

NOTE. — Presented before the New York Academy of Medicine, Section on Pediatrics, December 10, 1908. Discussion on page 134.

131

A CASE OF LEAD POISONING.

BY H. W. WRIGHT, M.D.,
Resident Physician, New York State Hospital for Crippled Children,
West Haverstraw, N. Y.

The following case which was seen with Dr. Matthew Sullivan, of Haverstraw, seems worthy of report because of the rather acute onset with convulsions, the mode of invasion of the poison and the extensive paralysis.

A girl of eight years, never previously ill except for mild attack of "malaria." Nutrition usually below par.

About two weeks before any symptoms of present illness began, the interior of the house in which the patient lives, was painted and papered. The water supply is above reproach and no other members of the family, which consists of five other healthy children, have been affected. On July 17, 1908, she had an attack of vomiting, with slight fever and prostration. The next day she sat up and was about the house presenting only a condition of moderate malaise until July 25th, when during the night she had a series of convulsions, which involved the entire muscular system. Unconsciousness followed the convulsions, but was very transitory. After the subsidence of the convulsive seizure, there was no paralysis observed until a week had elapsed. In the interim the patient complained of pains in her limbs, had a poor appetite and became constipated. She continued to be up and around the house, and about August 2d, paralysis was first observed in the right forefinger, which she was unable to extend; soon "wrist-drop" followed, then the same condition occurred in the left hand. The pain in feet became more intense and "drop-foot" gradually occurred. For the past two months intestinal colic has been occasional.

Physical Examination (November 10, 1908).—Mucous membranes pale; tongue pale and clean; eyes puffy beneath the lids. Along the margin of the teeth of the lower jaw there is pronounced black line, this is not evident in the upper jaw.

Extremities.—There is "drop-wrist" and "drop-foot" on both sides, the patient walking only with assistance. The flexors and extensors of the wrists and fingers are powerless, also the supinator longus and biceps of each arm. The triceps, deltoid and scapular muscles have escaped.

The extensors of the ankle and toes are entirely paralyzed, the flexors partially so as are also the muscles which invert and evert the feet.

Sensation is preserved throughout. Trophic disturbances are evident in excessive perspiration, coldness and slight edema of the extremities.

The achilles reflexes are absent, but the knee jerks are present.

The urine shows a trace of albumin. The heart is over-active and the arterial tension appears high in the radial pulse.

Because of the suddenness of the onset with convulsions and the rather quickly developing paralysis a condition of anterior poliomyelitis was first thought of; but as shown above, the paralysis is perfectly symmetrical and other symptoms strongly suggesting saturnism have appeared.

EPIDEMIC INFANTILE PARALYSIS.—Starr (*Journal of American Medical Association,* July 11, 1908) gives a summary of the 2,000 cases of epidemic infantile paralysis that occurred in New York last year. The onset of the disease was uniformly accompanied by fever. The paralysis was observed in the third or fourth day. Pain was a very marked symptom in almost all the cases and was usually greater in the paralyzed part. Anesthesiæ were not observed. The acute symptoms subsided in about ten days and the long slow improvement set in. In many cases a complete recovery has ensued. The mortality was about 6 per cent. or 7 per cent. Bacteriologic examination of the blood, cerebrospinal fluid and the various organs was negative. A biologic study of the cerebrospinal fluid was fruitless. Efforts at complement binding were negative. Apparently the diagnosis of poliomyelitis by means of a serum is, therefore, not possible. It is uncertain whether the causative agent is a micrococcus or a toxin, but the writer is inclined to the latter hypothesis. At the time of the epidemic other infectious diseases were not particularly prevalent. The summer was not unusually hot, but was unusually dry. No other facts were brought to light which might in any way explain the presence of this unusual epidemic.—*Boston Medical and Surgical Journal.*

IMPERFORATE ANUS WITH RECTOVESICAL FISTULA.

BY EDGAR F. KISER, M.D.,
Indianapolis, Ind.

The patient was a male child, white, the fourth of this mother, presented for operation thirty hours after birth.

Family History.—Parents both in good health. The first children were twins. Of these, the girl was perfectly developed and healthy. The boy had imperforate anus and died within a few days without having been operated. The next child was a girl, perfectly developed and in good health. This fourth child presents the same abnormality as the other male child.

Physical Examination.—The child is well nourished. Chest and abdomen negative. Imperforate anus. Has voided urine regularly and also passed from the urethra considerable quantities of thick tarry substance resembling meconium.

Operation.—The usual perineal incision was made, no anesthetic being used. The dissection was carried up for an inch and a quarter, but no rectal pouch could be found. Inguinal colostomy was considered, but thought inadvisable on account of the patient's general condition. Death occurred on the twelfth day.

Autopsy.—The rectal pouch was found on a line with the lower margin of the bladder, about an inch and three-quarters within the pelvis measured from the perineum. It communicated with the bladder through a fistulous opening a quarter of an inch in diameter.

YEAST IN GONORRHEAL VAGINITIS.—Kehrer (*Deutsch. Med. Woch.*, No. 5, 1908) has used preparations of yeast in gonorrheal vaginitis since 1901. After four to six days of treatment in acute cases, the condition is cleared up, and the gonococci cannot be found in the discharge. Also in erosions and cervical endometritis a distinct improvement is seen. In chronic cases, as a rule, the results are not so good, and if no results are obtained in four days the treatment should be changed. The author feels sure that the applications of solutions of yeast in gonorrheal vaginitis is the most valuable prophylactic method we have to prevent upward extension of the infection.—*Boston Medical and Surgical Journal.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Abstract of Report of Stated Meeting, Held December 10, 1908.

GODFREY R. PISEK, M.D., CHAIRMAN.

A CASE OF INFANTILE SCURVY WITH X-RAY PLATES.

DR. E. A. RIESENFELD presented this case. (See page 128.)

DR. THOMAS S. SOUTHWORTH said that in cases of such pain occurring in children who had a history of being fed with this particular kind of food, and water, the diagnosis of scurvy was easily made. He had had 3 such cases during the past year.

DR. HERMAN SCHWARZ reported the case of a baby who was fed for three, four or five months with bottled milk with some proteid and food mixture in it. A picture was presented by this child, with but few physical signs of what would have occurred if the child had osteomyelitis, infantile paralysis or rickets.

DR. GODFREY R. PISEK said that although the X-ray was very valuable to the general practitioner, frequently in these cases the diagnosis was not made and, unfortunately, these children were treated for other conditions while infantile scurvy was not thought of. When the X-ray was used, it really was only confirmatory of the diagnosis already made.

HEMORRHAGE IN THE NEWLY-BORN, APPARENTLY DUE TO DELAYED COAGULABILITY OF THE BLOOD—TRANSFUSION.

DR. HERMAN SCHWARZ and DR. REUBEN OTTENBERG reported an unusual case in which transfusion had to be performed in a newborn child. The child was born at full term and the delivery was a normal one. The mother had had several miscarriages. The baby was apparently well until the seventh day, when he began to vomit after feeding. On the eighth day the vomitus consisted of blood, and blood was noticed in the stools. On the tenth and eleventh days there was bleeding from the mouth. There was no skin eruption, the liver was palpable, and the spleen could be felt. The child's temperature was 99°F. There was no enlargement of the lymphatic glands. After the birth of the baby the mother developed an abscess of the breast, which was almost healed. The baby was brought to the clinic (Mt. Sinai) when eleven days old and was admitted to Dr. Koplik's wards. Ten c.c. of normal horse serum was injected subcutaneously. This was done because it was known that the injection of normal horse's or rabbit's serum had a distinctly beneficial effect upon the coagulability of the blood. To be effective, however, the serum must be less than two weeks old. This failed to have any effect upon the bleeding. The baby's blood coagulated in forty-eight minutes. The father's blood coagulated in from four to five minutes. If a portion of the father's blood was added to that of the baby, the coagulation time was reduced to the normal. The addition of calcium chloride or calcium lactate had no effect upon the coagulation time. This decided them to do transfusion. Dr. Berg performed this operation. At this time the hemoglobin was 40 per cent. and the number of white cells 27,600. The polymorphonuclear cells were 41 per cent. By the time the child was put on the table for operation the hemoglobin fell to 30 per cent. The father was the donor. At operation the child appeared as though dead. During the transfusion the hemoglobin increased from 25 per cent. to 30 per cent., to 70 per cent and to 90 per cent., and all in the course of twelve minutes. When the hemoglobin reached 90 per cent. the transfusion was stopped. As soon as the child got the father's blood the bleeding ceased. The coagulation time was then three and three-quarter minutes, practically normal. The blood examination showed the hemoglobin to be over 90 per cent., the red cells numbered 7,800,000, the white cells 24,400. No blood appeared in the stools or in the urine. The stools were still tarry from previous hemorrhages. The child appeared perfectly normal except for a temperature of 101°. On the second day the condition of the baby appeared good, and the stools appeared normal. On the third day the coagulability of the blood was from three and a half to five minutes. On the fifth day the coagulability was twenty-five minutes. For five days after the transfusion the child ceased to bleed. Then he began again to bleed, and calcium lactate was given. Mercury was also administered, but without avail. When the child was twenty-one days old he died as the result of these hemorrhages. He had some temperature, some discharge from the ears and death gradually occurred from the continued loss of blood.

Melæna neonatorum was excluded because the bleeding did not begin until the child was four or five days old. Hemophilia was excluded, because in this condition the coagulation time during the attacks was not delayed, although it was delayed during the intervals at times. In the case reported sepsis was probably the cause of the hemorrhages, although this could not be proven. There was the enlarged spleen, temperature, etc., and what part the abscess of the mother's breast played was an open question. In coagulation of the blood there were necessary three factors, namely, thrombogen, thrombokinase and calcium salts, and it was possible that the abscess in the mother's breast was responsible for the condition, causing an abscess of one or more of these three factors.

Dr. Schwarz said that if he ever had a similar case he would not attempt transfusion. If he could get fresh serum of blood, centrifuge it, and inject it subcutaneously, he thought better results would follow.

Dr. F. L. Wachenheim said that he suggested this treatment in 1903. In these hemorrhages it was probably the complement which must be supplied; this could be done by the use of any foreign serum.

INFANT MORTALITY—COMPARISON OF THE PAST AND PRESENT.

Dr. William L. Stowell presented this paper. He said that infant mortality might be considered as beginning before birth. Guillemot and Devillieres claimed that from 20 to 25 per cent. of pregnancies failed to mature. Illegitimacy was also a factor as illegitimate children showed a very high death rate, due to neglect or to the fact that children of this class were so often sent to institutions. Deformities such as spina bifida, patent foramen ovale, hydrocephalus, etc., lessened the likelihood of children living beyond infancy. Unfavorable constitutional tendencies such as syphilis, or tuberculosis in parents transmitted constitutional tendencies that lowered the power of resistance. Habits and morals of parents were visited on the children. For example, the child of drunkards had an unstable nervous system. In studying infectious diseases it was found that the number of children attacked increased in proportion to their exposure outside the home. The large number of infants attacked by digestive disturbances came from causes within the home. Pneumonia carried off a large number of infants. In 1906 more than 12,000 infants died from pneumonia in the registration area and 10,000 from bronchitis. The deaths from pulmonary disease and diarrheal diseases were keeping up in a marked proportion. It was a question whether physicians were treating these affections as wisely and successfully as they were the infectious fevers which had long been regarded as subjects for quarantine and disinfection.

It seemed to be a universal rule that mothers' children had about four times the chance of life that the orphan and the foundling had. At the Infants' Hospital, Randall's Island, the figures concerning "farming out" showed very marked fluctuations. In the main the mortality rates were lower than for the infants kept in the hospital.

Dr. Stowell spoke of the reduction in the mortality at the Infants' Hospital, due to the introduction of sterilization of milk and changes making for the greater care of the children. Overcrowding has a direct effect upon mortality.

This increase in mortality was seen to be greater in the case of young children. A table showing the population per acre in a number of tenement house blocks with the population under five years of age and all ages, the death rate of each class and the rate of mortality of certain diseases of childhood demonstrated very conclusively the effect of overcrowding when accompanied by bad hygiene. The number of deaths in some blocks might be due to the fact that adults were sent to the hospitals while children were cared for at home. Density alone was not necessarily a reliable standard as, for instance, the Ansonia, New York's largest apartment hotel. Here there were 2,000 persons living in 2,500 rooms, making a density per acre of 1,262. This was almost as dense as the densest tenement block downtown and yet the other conditions were as diverse as possible. Everything about the Ansonia was modern and hygienic. In seven years since the building had been opened there had been no infant death there, nor had any employe, of whom there were 400, given up work because of tuberculosis. This showed that under modern methods it was possible to have a dense population without a high death rate. This was not the case, however, with the poorer classes and the tenement population. The number of rooms was a safer criterion as to the death rate. The smaller the number of rooms the higher the death rate.

As regarded feeding it was generally admitted that the natural food for the young infant was the mother's milk. The tables from the Infants' Hospital showed clearly the results of wet nursing orphans and foundlings and bringing them up on the bottle. In general terms it might be said that the mortality among mothers' children was less than 10 per cent., while among wet-nursed children it was a little higher, while with the orphans brought up on the bottle there were twice the fatalities that there were among the wet-nursed.

In regard to infanticide he said that child insurance had been cited as a factor in the causation of infant mortality, but careful investigation seemed to exclude this as a factor. The mortality among insured children was less than the general mortality.

As a factor in infantile mortality, typhoid fever, since 1900, had declined somewhat. Malarial fever and influenza had also diminished. Smallpox, although the cases were exceedingly few, had increased. Measles and scarlet fever had remained the same. Whooping-cough had improved as also had diphtheria and dysentery. Pulmonary tuberculosis had fallen off slightly, although not so markedly as in the case of adults. Only 3 per cent. of the deaths from tuberculosis occurred in children under five years of age. This made the mortality exceedingly small when one remembered that 28 per cent. of all deaths occurred under five years of age. It might be expected that children would die of abdominal tuberculosis, but the deaths from abdominal tuberculosis numbered 3 per cent. of the deaths from all forms of tuberculosis at all ages. In 1905 there were 373 deaths from abdominal tuberculosis in the registration area of children under five years of age; that was two-tenths of 1 per cent. There had been a steady falling off in mortality rates in recent years due to the increasing knowledge of the causes of disease and the dissemination of such knowledge among the laity. Schools, health journals and boards of health were helping. Respiratory diseases had increased because of the falling off in tuberculosis. Pneumonia had increased 17 per cent. in England in the past forty years. The number of cases of death due to violence had increased. Diseases of the kidneys remained practically the same, as did also diseases of the circulatory system. Venereal diseases had increased relatively and actually. An increase of 40 per cent. in the last five years needed explanation or correction. There had been an increased efficiency in the management of infectious diseases, but the digestive diseases were in a large measure due to infection by means of the food supply and here we were losing ground. One had to take into account the season and atmospheric conditions as well as the character of the food. He referred to the part that warm weather played in causing the deterioration of food and to that which the fly played as a carrier of infection. Newsholme had given figures concerning 10,000 homes with analysis of deaths from diarrhea in babies. Of the 121 deaths, 6½ per cent. were nursed, 36 per cent. given cow's milk, 30 per cent. condensed milk. As high as 18 per cent. of diarrheal deaths had been found among breast-fed infants, showing that enteritis might occur when the food supply was ideal. The percentage of deaths from diarrhea and enteritis had not diminished at all in the last six years.

MR. WILBUR C. PHILLIPS, after reviewing the matter of statistics of infantile mortality, said that infant mortality was due to four or five principal causes: (1) Hereditary weakness, (2) poverty, (3) industrial conditions, (4) impure milk and (5) ignorance. All these were remediable. To remedy them, however, it was necessary to show a reason, and to show a reason one must have facts. Facts were most important, and each collector, no matter how small may be his part, contributed to the total sum of evidence in this important "case" of society *vs.* poverty, ignorance and cupidity.

Mr. Phillips told of the interest taken in the collection of statistics by the nurses connected with the New York Milk Committee, and read a series of questions which he had framed for their instruction.

DR. CHARLES HERRMAN believed that ignorance as a cause of the high death rate in infants was the one factor that could be dealt with immediately. Instruction should be given as soon as the baby was born. When the birth certificate was received by the Health Department a physician or nurse should be sent to the houses to instruct the mothers on the feeding and care of their babies. If it was not possible to visit all, those reported by midwives and persons not physicians should be selected. If the houses were visited several months after the receipt of the birth certificate, some babies would be dead and many mothers would have moved away. In order to carry out the plan properly the mothers should be visited immediately after the birth of the child.

DR. THOMAS S. SOUTHWORTH spoke of the change in the infantile mortality at the Infants' Hospital, Randall's Island, due to the renovation of the building, reorganization of the nursing staff and purifying the milk supply.

Election of officers for the ensuing year resulted in the election of Dr. Eli Long, Chairman; Dr. William Shannon, Secretary.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Abstract of Report of Stated Meeting, January 12, 1909.

J. P. CROZER GRIFFITH, M.D., PRESIDENT.

BROMIDE ERUPTION.

DR. FRANK CROZER KNOWLES read a paper on "Unusual Cases of Bromide Eruption in Childhood," based on 37 cases, with 4 more cases illustrating unusual types of eruption. None of the 41 cases were of the common acne type, only those with unusual features being considered. In 5 cases the eruption had been produced in the infant by bromine transmitted through the mother's milk, the baby having received no medication. The subject was discussed under etiology, dose of the drug and length of time required to produce the eruption, constitutional involvement, transmission through the mother's milk, various forms and distribution of the eruption, duration of outbreak, sequelæ, pathology, prophylaxis and treatment. Fifty references were included in the paper.

DR. GRIFFITH said that although there was no question among authorities as to the transmission of iodine through the mother's milk, the statements with regard to bromine were decidedly at variance. The collection of cases made by Dr. Knowles this evening seemed to settle the matter beyond doubt.

DR. KNOWLES referred to a case in an adult, recently reported by Pasini, in which the ingestion of bromine had been followed by enlargement of the thyroid. This was due, according to Pasini, to the fact that the thyroid gland normally contains bromine and iodine and has a great affinity for these elements.

SUBCUTANEOUS EMPHYSEMA COMPLICATING PNEUMONIA.

DR. CHARLES A. FIFE reported this case.

DR. J. CLAXTON GITTINGS recalled seeing a case of subcutaneous emphysema in a boy. It had developed on the right side of the neck, extending from the angle of the jaw to the clavicle, four days after operation for removal of adenoids. It persisted for eight days and was accompanied by moderate fever and evidence of systemic intoxication. Circumstances prevented bacterial examination, but the comparatively short and mild course would practically exclude the agency of the B. aerogenes capsulatus. Several other varieties of bacteria have been proved to be gas producers, however, notably some of the colon group.

Dr. Griffith said that he had seen a number of cases of subcutaneous emphysema, the first being one which followed sloughing of a tonsil in the course of a severe scarlet fever. Here the emphysema started in the neck and spread gradually down to the upper part of the chest.

PNEUMOTHORAX COMPLICATING PNEUMONIA.

Drs. Charles H. Weber and C. Y. White reported a case in a child of three and one-half years. Pneumothorax occurred on the eighth day of the disease, without any paroxysm of coughing or other unusual respiratory effort. At autopsy the perforation was found near the lower border of the upper lobe of the left lung. At the point of perforation the lung was covered with a recent fibrinous exudate and the tissue surrounding was consolidated with a pneumonic infiltration. Attention was called to the rarity of the condition in children and especially in pneumonia.

Dr. Alfred Hand, Jr., saw this case before death, and witnessed the autopsy, which cleared up for him a puzzling case of empyema he had seen some years ago. In that case the heart was greatly displaced, and the child died very suddenly, after taking a drink of water, several days after the empyema had been operated upon. The act of swallowing may have produced an instant pneumothorax, followed by death soon afterward.

Dr. Weber said that, in the 4 cases of pneumothorax in children mentioned by him, due to tuberculosis, there had been rupture of emphysematous vesicles; while in tuberculous adults in whom pneumothorax occurred, it followed as the result of cavities breaking down and opening into the pleural cavity.

Dr. Griffith then delivered the "annual address."

CURRENT LITERATURE.

Abstracts in this Number by
Dr. R. S. Haynes. Dr. J. Howland.
Dr. Henry Heiman. Dr. G. R. Pisek.
Dr. Samuel W. Thurber.

DISEASES OF EAR, NOSE AND THROAT.

Lotsch, Fritz.: Intubation in Diphtheritic Laryngeal Stenosis. (*Jahrbuch für Kinderhk.*, October 10, 1908, p. 427.)

This paper is based on 71 cases treated personally by the author at the Municipal Hospital of Magdeburg-Alstadt. Antitoxin was used in all the cases. Of the 61 cases that required operative interference (intubation or tracheotomy) 13 died. In only 3 of these was death due to asphyxia. The author uses Baer's modification of the O'Dwyer intubation set. The author does not use the extubator for removal of the tube. In its stead he employs the method devised by Trumpp. This consists in stretching the trachea and larynx by raising the chin with the left hand, when a somewhat forcible stroking movement of the trachea upwards toward the cricoid cartilage will usually dislodge the tube. The chin is then lowered when the tube is either expelled or readily removed by the finger. This method is simple and free from danger.

In one-third of the author's cases, extubation occurred spontaneously. In the other cases the tube was usually removed on the third day; 11 patients were intubated twice; 2 three times, and 1 six times. In 2 cases a primary tracheotomy was performed. Both died from subsequent cardiac collapse. Intubation was performed in 59 cases of whom 11 died. In 9 cases a secondary tracheotomy was performed, and of these 7 died, 3 from asphyxia. Of the 50 cases in which intubation alone was done, 4 died, 1 from cardiac collapse and 3 from pneumonia.

Displacement of the membrane is one of the most serious of the unavoidable accidents following intubation. The author had 3 such cases. In 2 a secondary tracheotomy was performed, in the third a reintubation. Laryngeal edema after intubation was not observed by the author. Obstruction of the tube by membrane is rare, and when it occurs the tube is usually expelled spontaneously, or the membrane expectorated through the tube. Premature spontaneous expulsion of the tube can usually be avoided by selection of a well-fitting tube and employment of proper care in intubation. If the tube has been properly inserted in the supraglottic space allowing the epiglottis to assume its normal position, difficulty in swallowing is rare. In no cases did the author find it necessary to use a stomach tube.

Intubation as contrasted with tracheotomy has the following advantages:

1. The inspired air is heated and moistened.
2. It can be more quickly performed.
3. It can be done without anesthesia.
4. The voice is less injured.
5. The convalescence is shorter.

The contraindications are severe angina of the pharynx, gangrenous pharyngitis, obstruction of the nasopharyngeal space and retropharyngeal abscess. HENRY HEIMAN.

DELEVAN, D. BRYSON: THE ETIOLOGY OF PARALYSIS OF THE RECURRENT LARYNGEAL NERVES OF PERIPHERAL ORIGIN. ANNALS OF OTOLOGY, RHINOLOGY AND LARYNGOLOGY. September, 1908, p. 631.

The causes of this form of paralysis may be divided into three groups:

1. Cases due to traumatism or laceration of the nerve trunks.
2. Cases of mechanical pressure upon the nerve.
3. Cases due to toxic influences, either in the nature of ingested poisons or toxemias from infectious diseases.

The author reports a case of death in a child two and one-half years old, due to the pressure of a large lymph node on the middle section of the trachea. The child had a general tuberculosis and suffered from urgent dyspnea for which a tracheotomy failed to give relief.

Cases of sudden deaths in children may also be due to the pressure of an enlarged thyroid. SAMUEL W. THURBER.

CANFIELD, R. BISHOP: DIAGNOSIS AND TREATMENT OF SUPPURATION OF THE LABYRINTH. (*Annals of Otology, Rhinology and Laryngology,* June, 1908, p. 451.)

The invasion of the labyrinth by a middle ear suppuration is marked by no symptoms as a rule. This is due to the fact that it occurs with a process associated with caries or cholesteatoma and extension takes place slowly from without. The sudden invasion does give symptoms. These are deafness which is apt to come on as a sudden loss of hearing in an already diseased ear; disturbances in equilibrium in which the patient tends to turn toward the affected side and is intensified with the eyes closed or after exertion. Nausea and vomiting are not as common. The condition is often made out only at the time of operation. The author cites the case of a girl of eight who had had an otitic suppuration for three years with no history of labyrinth involvement, yet her horizontal semicircular canal was found to be wholly destroyed. The case recovered with still no labyrinth symptoms. Another case in a girl of nine who had had ear discharge for six years dating from scarlet fever. For two weeks she had severe pain and dizziness, temperature 103 and thready pulse. On operation the posterior and part of the horizontal semicircular canals were found destroyed. She recovered.

SAMUEL W. THURBER.

LAYMAN, D. W.: REPORT OF A CASE IN WHICH DEFICIENT CEREBRATION WAS A PROMINENT SYMPTOM IN OTITIS MEDIA PURULENTIA CHRONICA—CURED BY A RADICAL MASTOID OPERATION. (*Annals of Otology, Rhinology and Laryngology,* June, 1908, p. 487.)

The boy of seven had suffered from chronic otitis media since scarlet fever, contracted in infancy. He had difficulty in sustaining attention and was dull and slow in school. This state was attributed to enlarged tonsils and adenoids which were removed in the spring of 1906. The following year the child was ugly and hard to manage. Aural treatment proved of little benefit and a radical mastoid operation was done, but not with the idea of improving the boy's mental state. However, three months after the operation he was a different child and, in school, learned as well as the average pupil of his age. The improvement in hearing was not real, but his attention was better. It is an interesting question whether the deficient cerebration is the result of feeling of fulness, irritation by pressure or due to the absorption of toxins due to the suppuration.

SAMUEL W. THURBER.

DISEASES OF THE SKIN.

Cocks, E. L.: The Diagnosis and Treatment of the More Common Diseases of the Skin. (*Medical Record,* March 28, 1908, p. 518.)

Impetigo contagiosa, pemphigus neonatorum, and a pustular syphilide are three diseases of early childhood that are not, according to the writer, clearly defined in the minds of the general practitioner. He says pemphigus neonatorum is not always a syphilitic manifestation. The lesion is a bulla, not a vesicle as in impetigo contagiosa, and there are only slight, if any, areolæ. The contents of the bullæ in syphilitic pemphigus are always pustular. It attacks the fingers in preference to the palm.

In differentiating eczema from intertrigo he points out that the discharge from eczema stiffens linen, while in intertrigo it does not. The erythema of intertrigo is deeper in the folds and fades to the periphery, and the reverse is true in eczema.

The following outlines of treatment are recommended: —

For scabies in children: ℞ Bals. Peru, ʒii; Prec. Sulphur, ʒi; Rosewater ointment, ℥iii, to be applied twice a day.

For impetigo, peroxide of hydrogen to the base of the lesion, followed by a 5 per cent. ammoniated mercury ointment.

For the pustular syphilid, lotio nigra externally, and internally mercury and chalk. Care of the nutrition is vital.

For intertrigo, removal of the cause, and applications of: ℞ Magnesiæ carb., ʒii; Zinci oxide, ʒii; Aquæ rosæ, ℥iv.

G. R. Pisek.

PATHOLOGY.

Crombie, J. Frank: The Leukocytosis of Whooping-cough with Analysis of 112 Cases. (*Edinburgh Medical Journal,* N. S., Vol. I., No. 3, p. 222.)

The value of Crombie's paper consists in the large number of personal observations which he reports.

In 73 cases of uncomplicated pertussis during the first three weeks of the disease a leukocytosis of less than 10,000 was met with in only 7 cases, while the leukocytosis *per se* may not be a reliable means of diagnosis, the lymphocytes are always increased absolutely or relatively.

Crombie believes that the degree of leukocytosis varies directly with the severity of the attacks, and that in the catarrhal stage it is a useful guide as to prognosis. In the later stages it varies directly with the number and severity of the paroxysms.

Crombie reports 4 cases complicated by pneumonia, all of which proved fatal. With 3 of these there was an enormous leukocytosis 57,800; 141,000 and 225,000 and yet in all instances differential counts showed the percentage of lymphocytes to be greater than that of polymorphonuclears.

He believes blood counts to be of great assistance in the diagnosis of doubtful cases.

J. HOWLAND.

BARACH, JOSEPH H.: MORPHOLOGY OF THE BLOOD IN PERTUSSIS. (*Archives of Internal Medicine*, Vol. I., No. 6, p. 602.)

From an analysis of 50 personal cases Barach confirmed the work of other observers. He concludes that "there is first a leukocytosis with an increase of all the forms; then a small cell lymphocytosis becomes conspicuous and continues to increase when the other forms have reached their limit. The large lymphocytes follow the course of the small ones, but they reach their greatest numbers after the small cells have reached theirs. During the stage of active lymphocytosis, bilobed small lymphocytes are frequently seen as well as numerous degenerated large lymphocytes, especially the basket forms.

"Then comes the simultaneous falling of the leukocytosis and lymphocytosis, while the polynuclears begin to resume their normal proportion. A little later the mast cells are observed more frequently, and an occasional myelocytes may be seen. While the leukocytosis and lymphocytosis continue to fall by lysis, an eosinophilia is noted; this continues for a variable time, after which the blood formula resumes its normal proportions."

The leukocytosis is found when the child first coughs, then increases and reaches its maximum sometime during the paroxysmal stage. The leukocytosis is roughly proportional to the severity of the disease and begins to diminish with an improvement of the symptoms.

Pneumonia as a complication increases greatly the leukocytosis but the lymphocytes even then may remain proportionately higher than the other forms. J. HOWLAND.

RISEL, HANS: SPASMOPHILE AND CALCIUM. (*Archiv. für Kinderhk.*, Band, XLVIII., Heft, III. and IV., p. 185.)

Stoeltzner has formulated the hypothesis that an anomaly of calcium metabolism is the basis of the spasmophile diathesis. He believes that a retention of the calcium, due to an insufficiency of calcium excretion by the intestines, occurs in the tissues at the time of manifest tetany. Risel, to investigate this, tested the electrical reactions of twenty-two children who exhibited more or less evidence of this diathesis before and after giving calcium acetate. He also tried the effect of various diets.

Five children with normal reactions were quite unaffected by calcium. The electrical excitability in 3 pathological cases was apparently increased while in 5 cases it was uninfluenced. In eleven children, however, with an increased reaction to Ca O C this gradually returned to normal after the use of calcium.

Risel concludes that calcium given to children does not increase the galvanic excitability of the peripheral nerves, and his clinical experiment does not show that calcium has nearly the same effect on the production of tetany as does cow's milk. He does not think, however, that calcium has so much influence in diminishing the electrical excitability as does an appropriate diet.

J. HOWLAND.

PACCHIONI D., AND FRANCIANI, C.: BACTERIOLOGIC INVESTIGATIONS IN MEASLES. (*Jahrbuch für Kinderhk.*, October 10, 1908, p. 391.)

Previous investigations have shown the frequent presence in the conjunctival, nasal, and bronchial secretions of a hemophile bacillus resembling the Pfeiffer bacillus. Occasionally the same organism was found in the fluid of a complicating pleuritis, pericarditis, arthritis or meningitis. Blood cultures during life have been negative in most of the investigated cases.

The authors during the last epidemic in Florence undertook once more the study of the bacteriologic problems presented by the disease. In 25 cases blood cultures were made during life. In only one of these was the hemophile bacillus found. In 7 the micrococcus catarrhalis was demonstrated. To determine the relation of the hemophile bacillus to the disease, the authors employed a modification of Wright's method in which an emulsion of the hemophile bacillus was mixed with the patient's blood. They found an average index of 1.9 in 19 cases in which the determination was made while the rash was present. In 19 cases examined after the disappearance of the rash, the average index was 2.2. Should the studies now in progress demonstrate an increase in the other defensive agencies of the body against the hemophile bacillus, the problem of the pathogenesis of measles will be solved.

HENRY HEIMAN.

OLDHAM, RALPH S.: A CASE OF GENERALIZED VACCINIA, WITH REMARKS ON THE PATHOLOGY OF THE DISEASE. (*The Dublin Journal of Medical Science,* July 1, 1908, p. 1.)

Oldham reports a case of vaccination, which on the ninth day began to develop into generalized vaccinia, involving most of the arm. The author puts forward the theory that generalized vaccinia is an endeavor on the part of the cytoryctes vacciniæ to revert to cytoryctes variolæ. He quotes many authorities who agree that both variola and vaccinia are caused by the same organism, only that in the latter condition the organism is much attenuated, and its life cycle which is asexual takes place in the cytoplasm of the cell only. In variola the life cycle which is asexual takes place in the cytoplasm and that which is sexual in the nucleus of the cell.

In the internuclear development of the cytoryctes variolæ the protozoon develops spores which are air borne. The product of the cytoplasmic cycle of the cytoryctes vacciniæ are not air borne. Hence communicability is explained.

G. R. PISEK.

VON PIRQUET, CLEMENS: EXPERIENCES WITH THE CUTANEUS TUBERCULIN REACTION AND THE FINDINGS IN TWO HUNDRED POSTMORTEMS ON CHILDREN. (*The Cleveland Medical Journal,* November, 1908, p. 585.)

Of 200 children who had undergone the cutaneous tuberculin test, 200 died and were dissected. In 109 cases no tuberculosis was found; all these reacted negatively. Two cases which reacted positively were uncertain postmortem. Eighty-nine cases showed tuberculosis. Of these 60 were positive at the first test and 29 negative. Of the latter 6 reacted later to Moro's inunction test; several were suffering from measles, in which during the exanthem and the week following there is no reaction; while the rest were nearly all cases of miliary tuberculosis where the reaction may not occur.

The author concludes that in infancy a reaction means a great danger to life; from birth to five years nearly all infected children react at once; in adults and older children there may be a tuberculous reactivity due to slight infections which do not cause any inconvenience to the patient, and therefore only a very severe reaction at first has any significance, meaning a new process at work; on the other hand, failure to react after repeated inoculations (except in measles or miliary tuberculosis) proves that the individual is free from tuberculosis. R. S. Haynes.

Bruckner, Max.: The Von Pirquet Tuberculin Reaction. (*Jahrbuch für Kinderhk.*, September 2, 1908, p. 265.)

The author reports the results of his own observations on 160 children from the Kinderheilanstalt at Dresden. Ninety-seven were male and 63 female children. The youngest child was eighteen days old and the oldest thirteen and one-half years. Of these, 57, or 35.5 per cent., gave a positive reaction.

There were positive in the 1st year	3	cases, or	9.67	per cent.		
“ “ 2d “	6	“	“ 31.6	“	“	
“ “ 3d “	15	“	“ 28.5	“	“	
in the 4th and 5th “	13	“	“ 31.6	“	“	
in the 6th, 7th, 8th and 9th “	22	“	“ 50.0	“	“	
in the 10th, 11th, 12th, 13th, 14th “	14	“	“ 54.0	“	“	

Subtracting the cases of manifest tuberculosis from those which reacted positively, the author finds the percentage of latent tuberculosis at various periods of life to be as follows:—

In the 1st year	0.	per cent.
“ “ 2d “	23.5	“ “
“ “ 3d “	21.1	“ “
“ “ 4th and 5th years	23.5	“ “
“ “ 6th to 9th years	40.5	“ “
“ “ 10th to 14th years	29.4	“ “

The original technique of Von Pirquet was adopted. The tuberculin, however, was applied to 3 points instead of 2. The duration of the reaction was three to twenty days. A secondary reaction (*i.e.,* a positive reaction with 100 per cent. tuberculin after a previously negative one with 25 per cent. tuberculin) was present in 28 cases. Fifteen children came to autopsy, 4 of which gave a positive reaction; 3 of these showed characteristic tubercular changes on postmortem examination. Of the 11 negative cases that came to autopsy only 1 showed the presence of tubercular infection, namely, miliary tuberculosis of the lungs and liver.

The author's conclusions are as follows:—

(1) A positive cutaneous reaction demonstrates with reasonable certainty the existence of tuberculosis.

(2) It is of greater value the younger the child. After five years of age the value of the method is considerably reduced.

(3) A negative reaction where physical signs are not present speaks for the absence of tuberculosis.

(4) The method is without danger where there is no recent or old scrofulous disease of the eye.

(5) Further investigation is necessary to determine the prognostic value of the method. At present it should not be employed in general practice. HENRY HEIMAN.

SURGERY.

KINGSBURY, I. W.: HYPERTROPHIC PYLORIC STENOSIS IN THE INFANT: REPORT OF A CASE WITH RECOVERY AFTER OPERATION. (*From the Transactions of the Connecticut State Medical Society,* 1908, pp. 106-120.)

After an excellent description of the affection, and its medical and surgical treatment, recommending immediate operation upon diagnosis, Kingsbury reports a case of hypertrophic pyloric stenosis in a boy of two and a half months with short loop posterior gastroenterostomy on the thirty-fifth day after onset of vomiting, followed by rapid recovery and a gain of 9¾ pounds in the next nine months. A very complete bibliography with abstracts of references is appended. R. S. HAYNES.

MEDICINE.

KOPETZKY, S. J.: SIGNIFICANT FEATURES OF MIDDLE-EAR SUPPURATIONS IN INFANCY AND CHILDHOOD. (*Medical Record,* February 29, 1908, p. 350.)

The writer points out the value of the distinctive features of ear disease to the pediatrist, and alludes to the fact that a considerable number of all cases of ear disease occur in children, and that this is largely referable to the local anatomical characteristics of the immature auditory apparatus coupled with a weak resistance. He concludes that the significant features lie (1) in the existence of the purulency without perforation; (2) in the presence of a discharge from the Eustachian tube to the pharynx; (3) in the exhibition of temperature, early facial paralysis and marked disturbance of stomach and bowel; (4) in the advent of periosteal abscess; (5) in the rapid progress of destructive processes in the petrous bone; (6) in the tendency to intracranial complications; (7) in the possibility of early primary bulbar thrombosis; (8) in the existence without thrombosis of otitic pyemia, and (9) in the sequelæ of certain forms of ear disease in the child, who is exposed to the danger of deaf mutism. G. R. PISEK.

KERLEY, C. G.: PERSONAL OBSERVATION IN SCARLET FEVER. (*The Journal of the American Medical Association,* October 24, 1908, p. 1,407.)

Scarlet fever the author regards as both contagious and infectious. The incubation period is from five to nine days. Kerley says he has seen scarlet fever develop on the third day after exposure, another developed on the twelfth day. Few, however, pass the seventh day.

Like other exanthemata the cases may be so mild as to pass without recognition or so severe as to be fatal in a few hours. The onset is usually sudden. Fever and angina are the most constant symptoms. The degree of temperature indicates fairly accurately the severity of the infection. The rash in scarlet fever has less exclusive characteristics than the other exanthemata. The rash in septic processes simulates scarlet fever very closely; and various drug and indigestion rashes are often mistaken for it. In differentiating these difficult cases, he looks on angina as one of the most constant symptoms of scarlet fever. The strawberry tongue is of little value. The desquamation is subject to wide variation. In some cases it will disappear before the rash has subsided, in others not until two or three weeks have elapsed. A second desquamation may occur. Second attacks of scarlet fever are usually severe. In managing cases of scarlet fever the first thought should be to place the child under the most favorable hygienic conditions. The disease cannot be shortened, and it being a case of resistance, the patient's energy should be conserved in every way possible. The child should be kept at rest in a large well ventilated room. The clothing should be the usual night clothing and bed clothes. Diet should be reduced; milk which is usually not borne well should be diluted. Gruels and animal broths may be given; kumyss, orange juice and zwieback are given in selected cases. Water is given freely. The bowels must be evacuated once a day. The urine must be examined each day for albumin.

The patient should be bathed and oiled twice a day. The author states that aside from watching the systemic efforts of the poison we should keep in touch with the condition of the heart, glands, throat and ears. Stimulants are not to be given unless there is specific indication. Alcohol is given in severely septic cases. The heart stimulants to be used are strychnine, digitalis and strophanthus. In severe angina chlorate of potash is given internally and hydrogen peroxide as a spray. When there is extensive involvement with edema and false membrane, irrigation of the throat is resorted to. Cold compresses are used to prevent adenitis. Pyrexia should be treated with cold sponging and cold packs. The temperature should be reduced when it causes restlessness, loss of sleep and rapid heart with resulting loss of vitality. This may be when the temperature is 103° F. or sometimes not until it is 105° F. The mere degree of heat should not be the only indication but the symptoms induced should be considered. G. R. PISEK.

HIRSHBERG, LEONARD K.: TETANY IN AN INFANT FOUR DAYS OLD. (*The Journal of the American Medical Association,* August 29, 1908, p. 755.)

The author cites the case of an infant born unusually clean and who had a curious red scarlatiniform rash over its entire body. It developed the symptoms of tetany on the fourth day. There were no nervous symptoms for three days. On the fourth day tetanic movements of the hands, arms and legs were noticed, dyspnea and temporary cyanosis occurred. Trousseau's and Chvostek's signs were present. The child died on the ninth day.

The author attributes the condition to one of two possible causes; either that there was disease of the parathyroids or else there was some derangement of the gastrointestinal tract. The scarlatiniform rash and a slight goiter of the mother led him to think of the parathyroids. On the other hand vomiting which increased on feeding led him to attribute the cause possibly to the gastrointestinal tract. G. R. PISEK.

NAGEL, M.: THE DIAGNOSIS OF ENLARGED BRONCHIAL AND MEDIASTINAL LYMPH-NODES BY PHYSICAL SIGNS. (*Jahrbuch für Kinderhk.*, July 4 1908, p. 46.)

Occasionally the existence of enlarged bronchial and mediastinal lymph-nodes can be diagnosed from the symptoms of intrathoracic pressure, namely, pain between the scapulæ, dyspnea, dysphagia, venous congestion, differences in the radial pulses, reflex cough, cardiac arrhythmia, bradycardia, and paresis of the vocal chords. In addition to these symptoms a number of physical signs have been described by various observers. The most important of these are dullness, bronchial breathing, and râles between the scapulæ at the level of the third to fifth dorsal vertebræ; tenderness over the second to seventh dorsal spines; (spinalgia); and the detection of tender nodes by means of an inflatable esophageal sound. The Roentgen rays are also of great diagnostic aid, especially in caseous and calcified lymph-nodes.

Recently Von Korányi described a method of percussing over the spinous processes of the vertebræ, which De la Camp and the author have utilized for the diagnosis of enlarged lymph-nodes. Normally we find dullness over the first four dorsal vertebræ, and resonance from the fifth to the tenth dorsal vertebræ. In 26 children with general glandular enlargement, De la Camp found 14 in whom there was dullness over the fifth dorsal spine; in 7 of these the Roentgen rays confirmed the diagnosis of enlarged infratracheal glands. In 50 similar cases, the author found 16 with dullness at the same site. In 3 experimental cases, where paraffin was injected postmortem in the vicinity of the bifurcation, the author succeeded in demonstrating a previously non-existing dullness over the fifth and sixth dorsal spines. Dullness in this region may also be due to mediastinal tumors, pleural effusions, and atelactasis, so that these conditions must be excluded before the diagnosis of enlarged lymph-nodes is made.

HENRY HEIMAN.

HYGIENE.

CRAMPTON, C. WARD: ANATOMICAL OR PHYSIOLOGICAL AGE VERSUS CHRONOLOGICAL AGE. (*Pediatrics*, June, 1908, p. 341.)

The author states that the anatomical or physiological age should be taken as a standard, by which to judge the child, instead of simply by the number of years the child has lived. He believes a child is mature or postpubescent when the pubic hair is fully developed. The presence of the hair is only second to the finding of the spermatozoon as a sign of maturity. The mature are 33 per cent. heavier, 10 per cent. taller, and 33 per cent. stronger than the immature at the same age. (The author gives a table to substantiate these figures.) There are also mental differences to be observed. The immature boys at all ages fail in their ability to pass the work of any grade much more than those who are mature.

The acceleration of growth rate puts all the organs under new conditions. Morbidity increases during puberty; mortality does not. Before puberty the blood vessels are large and the heart small. The heart increases at puberty at a far greater rate than the arteries. Blood pressure is raised at this time and characteristic functional affections of the heart occur. At puberty previous tendencies to abnormalities may be overcome both by nature and by treatment.

Turning to diseases of the period of puberty we find that diseases of childhood decrease and diseases of adult life appear. Rheumatism, epilepsy and chorea are characteristic. On the mental side we have a tendency toward morbidity; masturbation and other abuses assist in unhinging the weak mind. Hysteria is common at this period. At puberty there is awakened in the child a desire to fit itself to enter the adult scheme of things. The author recommends that mature children in public schools should be taught something which will prepare them for immediately taking an active part in life.

Fault is found with the fact that mature and immature children are thrown together in our present system. In the upper grammar grades and in the high schools the mature are probably not on the average so very much better in mere scholarship than the immature, but they have a whole range of abilities related to success in life, which if trained at this point would lead to personal and civic efficiency; while if neglected they become relatively useless and perverted. The author recommends the separation of mature from immature children in the elementary or high schools, so that the pedagogical, ethical and social treatment to which they are subjected may be better adapted to their distinct requirements and abilities. Crampton believes that it is contrary to common sense to use the chronologic age as a basis for deciding when a child should be permitted to work. He recommends that child labor legislation be based upon the physiological age.

In conclusion he recommends that all observations, records and investigations of children and all treatment of children, whether it be pedagogical, medical, social or ethical should take physiological age as their basis.

G. R. PISEK.

STOWELL, WILLIAM LELAND: THE RELATION OF TUBERCULOUS COWS TO TUBERCULOSIS IN CHILDREN. (*Medical Record*, June 20, 1908, p. 1,023.)

After reviewing the literature, Stowell gives his conclusions from studying the conditions at the hospital on Randall's Island, New York City. The milk used was from two sources—from a herd kept on the island and from a city dairy. The latter was pasteurized; the former was raw. Tests and autopsies found the herd diseased. The writer concludes that the danger of tuberculous infection from milk must be very slight, for there was no evidence of tuberculosis developing more often among those fed on the farm milk than on the pasteurized supply. There was a tuberculous dairy and tuberculous children, but a careful analysis failed to show that one depended on the other.

G. R. PISEK.

THERAPEUTICS.

SZONTAGH, FELIX.: THE ANTITOXIN TREATMENT IN DIPHTHERIA. (*Jahrbuch für Kinderhk.,* September 2. 1908, p. 281.)

Owing to certain theoretical considerations, the author regarded with considerable scepticism the sanguine claims of the original investigators in this field. It was not until he had observed the action of the serum in a case of malignant diphtheria that he became convinced of the beneficial effects of this method of treatment. The results of subsequent clinical investigations led the author to the conclusion that the most potent and direct effect of the serum is on the local focus of infection and not on the general condition. In fact, the author is inclined to deny any great importance to the toxin-neutralizing action of the serum. Likewise, he thinks that it has but slight influence in the prevention or cure of diphtheritic paralysis. In the author's extensive experience (over 1,000 cases) malignant cases of diphtheria are absolutely resistant to the action of the serum, even when it is administered in large doses very early in the course of the disease. In these cases the fatal result is often incorrectly attributed to a mixed infection. Just why certain cases are uninfluenced by the antitoxin serum it is difficult to say; perhaps it is due to an inherited disposition. When diphtheria is associated or complicated with tuberculosis, the serum seems to have no effect whatsoever on the course of the disease. The beneficial local action of the antitoxin serum is apparently more marked in tonsillar and pharyngeal than in laryngeal diphtheria.

HENRY HEIMAN.

KOPLIK, HENRY: THE TREATMENT OF CHOREA MINOR, WITH ESPECIAL REFERENCE TO THE DANGERS OF THE ARSENIC THERAPY. (*Medical Record,* January 18, 1908, p. 95.)

Koplik calls attention to the fact that chorea minor is a self-limited disease. The index of tolerance of the drug, according to the author, is the action of the kidneys, not the puffiness under the eyes. The slightest sign of albuminuria is a danger signal to stop its use. In mild cases of chorea the patient should receive no arsenic. Light diet (milk and eggs), plenty of sleep, sedatives, fresh air, sunshine and quiet play.

In moderately severe cases the patient is placed in bed, but not completely isolated. Sedatives are given and hydrotherapy (a pack at 100°F.; this is lowered and the child kept in it for fifteen minutes and then given a rub).

In severe cases, where paralysis is present, the treatment consists of sedatives, strychnin and hydrotherapy. Isolation is here insisted upon, and so is fresh air and sunshine. Arsenic in these cases is especially deprecated because of the liability to cause neuritis. The author thinks the dark room treatment is depressing and irritating to a child's nature and is characterized by him as being well nigh brutal. G. R. PISEK.

INFANT FEEDING.

BRENNEMANN, JOSEPH: REMARKS ON THE FEEDING OF THE HEALTHY INFANT. (*Journal of the American Medical Association,* July 11, 1908, p. 101.)

Brennemann believes there is an overwhelming mass of evidence which discredits the fundamental principles of the percentage method. A food of a certain quantity and composition that yesterday was adapted to a healthy infant, to-day may act as so much poison to the same baby. The most serious question is what to feed a newborn baby. He recommends a dilution of one part milk and two parts water, with small amount of milk sugar, as ¼ to ½ ounce in twenty-four hours. After the fifth to sixth month, ability to digest starch is well established and water diluent may be replaced by gruels. In the latter months of the first year broths, strained vegetable soups, beef juice, fruit juice, zwieback, cracker, cereals, etc., are to be given. The author believes it best to feed a baby no more than five to six times in the twenty-four hours, and not more than four times at the end of the year. In other words, four-hour intervals are advocated. He attributes much of the indigestion of this period to too frequent feedings. If overfeeding is unchecked we are told that marasmus will be the ultimate outcome. Milk overfeeding, especially of the fats, produces characteristic putty-like stools with marked constipation. The prevalence of the summer diarrheal diseases is explained rather on the idea of a metabolic disturbance than an infective process, and thus pointing again to the reduction of food in hot weather. An ounce and a quarter of milk to the pound of body weight is regarded as correct for the average healthy baby. The calorimetric standard is advocated to obtain a balanced feeding, and Brennemann insists that the amount should not be increased if the child is thriving, no matter how low the quotient.

The author concludes that the contention that the proteid of cow's milk is difficult to digest has no longer any evidence to support it. That the fat is easily digested and metabolized is doubtful. The assumption that the percentage of different food elements is of prime significance is equally untenable. The percentage of food elements *per se* has no bearing on overfeeding or underfeeding. G. R. PISEK.

TOBLER AND BOGEN: THE DURATION OF GASTRIC DIGESTION OF MILK. (*Monatschrift für Kinderhk.*, April, 1908, p. 12.)

For this investigation the Roentgen rays were employed. The authors found that the presence of as small a quantity as 5 c.c. could be determined by this method. It was not necessary to use bismuth in infants, as in most cases the stomach contents gave a distinct shadow. After ingestion of 100 to 200 c.c. of milk, the stomach appears as a round or oval body, with the long axis in the vertical line. The level of the fluid can be made out with ease. The authors studied the influence of various factors on the time required for the stomach to empty itself. In normal breast-fed infants the stomach was found empty after one and one-half to two hours, varying with the quantity of food ingested. When the quantity of food is increased the duration of gastric digestion increases, but not in proportion, *i.e.,* if double the quantity is given, the delay is only one-third or two-thirds more. The character of the food also plays an important rôle. The presence of fat considerably delays the emptying of the stomach. This is probably due to the inhibitory action of the fat on the secretory glands of the stomach and to the long continued closure of the pyloric sphincter.

Carbohydrates hasten gastric digestion. The dilution of the milk has a decided influence on the duration of gastric digestion. If the dilution is one-half the duration is shortened; if more than one-half a delay takes place. HENRY HEIMAN.

BOOK REVIEWS.

GUIDE TO THE CLINICAL EXAMINATION AND TREATMENT OF SICK CHILDREN. By JOHN THOMPSON, M.D., Fellow of the Royal College of Physicians of Edinburgh, Physician to the Royal Edinburgh Hospital for Sick Children, Joint Clinical Lecturer on the Diseases of Children, University of Edinburgh, Honorary Member of the American Pediatric Society. Second Edition, Greatly Enlarged and Rewritten, with 160 illustrations. Edinburgh and London, William Green & Sons. Chicago, W. T. Keener & Co., 1908.

This second edition which has been greatly enlarged, fulfils admirably the intention of the author to provide a book which should act as a preparation for and instruction to the larger standard works on the diseases of children. The wide range of the material included in its six hundred odd pages is so great that brevity is essential. The book, however, is much more than a compend, and although one is inclined to wish that a writer of so much experience had written a more exhaustive work, he is well rewarded for his perusal by the pleasantness of the style and the many, often unusual, practical points drawn from the fulness of the writer's personal knowledge. The illustrations are good and most instructive.

BACTERIAL FOOD POISONING. By PROFESSOR DR. A. DIEUDONNÉ, Munich. Translated and edited with additions by DR. CHARLES FREDERICK BOLDUAN, Bacteriologist, Research Laboratory, Department of Health, City of New York. Authorized Translation. New York, E. B. Treat & Co., 1909.

This excellent translation of Dr. Dieudonné's monograph presents to the English reader the subject of Bacterial Food Poisoning in a concise yet detailed form. Meat poisoning, poisoning through fish and mollusca, through cheese, through ice-cream and puddings, through canned goods, potato poisoning and metallic poisons are considered from an historical and a bacteriological standpoint, and suggestions are made toward prophylaxis and treatment.

While not of use to the pediatrist especially, this little work will be of invaluable help in the diagnosis and treatment of the occasional case of food poisoning which occurs in all classes of practice.

SURGICAL DISEASES OF CHILDREN. A MODERN TREATISE ON PEDIATRIC SURGERY. By SAMUEL W. KELLEY, M.D., Professor of Diseases of Children, Cleveland College of Physicians and Surgeons; Surgeon in Chief, Holy Cross Home for Crippled Children; Pediatrist St. Luke's Hospital and City Hospital; Pediatrist and Orthopedist St. Clair Hospital; President of Section on Children, American Medical Association, 1901; President of Association of American Teachers of Diseases of Children, 1908; Member of Association of Military Surgeons of the United States. 765 pages. New York: E. B. Treat & Co. 1909.

Dr. Kelley has produced a distinctly useful book, and has brought together into one volume materials for which, hitherto, one has had to look among several. Treatises on Orthopedic Surgery, on General Surgery, on Diseases of the Ear, on Diseases of the Throat, and on Nervous Diseases have all contained considerable surgical information applicable to children written from the standpoint of their specialty. Dr. Kelley has gathered all this information together and presents it from the standpoint of the pediatrist. To avoid encroaching upon medical pediatrics in so exhaustive a treatise is a somewhat difficult task, but Dr. Kelley has, on the whole, kept closely to the surgical field. The book gives evidence of a great deal of experience and of common sense on the part of the author and impresses one with its up-to-dateness. References are made to 1908 literature, and sections on such present subjects as the serum diagnosis of syphilis, vaccine therapy, opsonic indices, and Bier's hyperemic treatment are full and complete. Especially good are the sections on General Subjects, Fractures and Dislocations, the Surgery of the Air Passages, Appendicitis and Hernia. The illustrations are many and excellent and in themselves well worth much study. The book as a whole is well made and printed.

To the general practitioner, to the pediatrist, and to the general surgeon alike Dr. Kelley's book should prove to be exceedingly helpful.

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ORIGINAL COMMUNICATIONS.

CONGENITAL MALFORMATION OF THE ESOPHAGUS WITH THE REPORT OF A CASE.* †

BY J. P. CROZER GRIFFITH, M.D.,
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AND
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Although malformations of the esophagus have been reported with considerable frequency on account of the striking symptoms presented, they are, in fact, comparatively uncommon. Careful study of the matter has been made by Mackenzie, Kraus, Marsh, Phillips and others. Mackenzie could collect but 63 cases, and Dickie, writing in 1906, found but 13 additional ones. He fails, however, to mention these by name. The most valuable contribution of recent date is that of Happich, in which, as well as in Mackenzie's text-book, will be found the bibliography for reported cases not specifically mentioned by us.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 25, 1908. Discussion on page 175.

† From the Children's Medical Ward and the Pepper Clinical Laboratory of the University of Pennsylvania.

Malformations may be of various forms. Ignoring bronchial clefts which belong rather to another category, these may be:—

(1) *Total Absence of the Esophagus.*—This is a very rare condition associated generally with other serious malformations, such as seen in acephalous monsters with defects in the thoracic and abdominal viscera. Happich collects 7 cases of this anomaly, viz., those of Sonderland, Tiedemann, Cooper, Mondière, Lozach, Heath, and Mackenzie. Kraus adds none to the list; and we have found no records elsewhere.

(2) *Partial or Complete Doubling of the Esophagus.*—This also is an extremely rare disorder, there being in Happich's list only the 2 cases reported by Blasius. To this we may add the case of Kathe, published in 1907, in which a narrow supplemental lumen appeared to exist in the wall of the tube.

(3) *Tracheoesophageal Fistula without other Lesion of the Esophagus.*—Like the others this is also very rarely seen. Happich quotes but 4 cases, those of Pinard Tarnier, Richter, and von de Water; and reference to the original communication shows that the reports of Pinard and Tarnier were upon the same case, so that the number is actually but 3. Kraus mentions the 3 cases of Vrolick, Lamb and Eppinger.

(4) *Stenosis.*—The cause of this may be either a fold of mucous membrane, as is the cases of Rossi, Tenon, Kraus, and others, or a narrowing involving the entire wall of the esophagus, as in the case of Hirschsprung. In certain instances of stenosis recorded, viz., those of Home, Cassan and Berg, and Follin, it is far from sure that the condition was congenital in origin. Very probably carcinoma may have been the cause. Omitting these we have found the records of but 20 cases, viz., Rossi, Tenon, Bauernfeind, Gianella, Siegert, Worthington, Brenner, Zenker, Mayer, Hirschsprung, Schneider, Cruveilhier, Blasius, Fagge, Wilks, Turner, Crary, Baillie, Wadstein, and Demme.

(5) *Congenital Dilatation.*—This is limited to the portion of the esophagus just above the diaphragm. The condition was

first described by Arnold and by Luschka, the latter of whom applied to it the appropriate term "Vormagen." The case described by Rotch appears to be a very typical instance. The condition may lead to a secondary diffuse dilatation involving the entire length of the esophagus. Although Vigot, it is true, described funnel-shaped diverticula arising from the anterior wall of the esophagus, it is doubtful whether these are ever really congenital. It is claimed by some that the foundation for the development of pulsion diverticula is laid in a congenital weakness of the muscular elements of the esophageal wall.

(6) *Obliteration of the Esophagus in only a Portion of its Extent, Unaccompanied by Fistula.*—This, too, is very uncommon. There are several varieties. Only the upper portion of the esophagus may be normal, the position and extent of the lower obliterated fragment varying with the case. This was true in the cases of Brodie, Durston, Schoeller and others, that of Durston being the first case of congenital malformation of the esophagus recorded by anyone. In other instances both upper and lower fragments of the esophagus are patulous, and a more or less distinct muscular or connective tissue cord or band united them, as in the cases of Marsh, Weill and Pehu, Steel, and Shattock. Whatever the form, the degree of preservation of the obliterated portion is subject to great variation. In some cases the esophagus is described as entirely absent. In others, the cord-like character was distinctly present. In some, as in the case of Phillips, there seemed to be an absolute disappearance of the intervening portion of the esophagus, but microscopical examination showed remains of the esophageal tissues. In all, of course, the lumen of the affected portion was completely obliterated. The term "obliteration" is, indeed, only used here to describe the condition of the *lumen,* whatever the state of the walls might be.

It is questionable whether in any of the reported cases the tissues of the obliterated portion of the esophagus have been entirely wanting. The matter could be settled in any instance only by careful, and often microscopical, study of the posterior wall of the trachea, since the tissues of the esophagus are firmly attached to this region and often apparently lost in it.

Happich has collected only 11 cases of this partial obliteration of the esophagus without fistula, viz., those of Marrigues, Lallemand, Brodie, Durston, Röderer, Toujan, Lichty, Shattock, van Cruyk, Weill and Pehu and Marsh.

We may add the case of Steel, 3 cases of Kraus and the 2 cases recently reported by Phillips, to one of which we have just referred.

(7) *Obliteration of a Portion of the Esophagus with Tracheoesophageal (or Bronchoesophageal) Fistula.*—This is by far the most frequent malformation found. Of Mackenzie's 63 cases of esophageal malformations, 43 were of this nature, and Happich has tabulated carefully 59. Detailed enumeration of these may be obtained in the bibliography of these two writers. We have found published in the last six years 14 additional instances, 12 of them since the appearance of Happich's monograph. These are, viz., cases of Kirmisson, Renault, Villemin, Patron, Keith and Spicer (4 cases), Dickie, Guyot, Fischer, Spicer, and Giffhorn (2 cases). Another case very briefly reported by Guillemet probably belongs to this category. In addition, there are 2 cases published by Dam and by Wunsch respectively, in which there was no autopsy made, but in which an obstruction was discovered by the use of a sound, and which possibly belong here also.

Malformations elsewhere in the body are very liable to occur in combination with this defect (28 of Happich's 59 cases), as, in fact, with congenital defect of the esophagus of whatever nature. The occlusion of the esophagus may be very short, or may exist in the form of a fibrous cord which is either quite evident or almost indistinguishable, and which may or may not contain distinct evidences of muscular fibre. The esophagus throughout its extent is generally firmly adherent to the trachea, and the obliterated portion especially so, or even almost indistinguishable from the posterior tracheal wall. The obliteration is almost always situated at or a little above the bifurcation of the trachea. When it is of very short length the two fragments of the esophagus frequently appear to overlap each other. The upper fragment of the esophagus is generally dilated, with its walls hypertrophied. It is usually rather funnel-form than cylindrical, and ends blindly at the point of obstruction. As a rule, the lower fragment is of normal calibre for some distance above the stomach, and then gradually tapers in an upward direction, ending in a fistula into the trachea. It is noticeable that the fistula is always in the lower fragment. The only exception recorded is that of Fischer, in which, in addition to the usual fistula in the lower portion, there was also a very minute opening into the trachea from the upper fragment of the esophagus. The fistula is usually slit-like in form and enters the trachea oftenest shortly above the bifurcation; less often just at the position of the bifurcation. Fistula into the bronchus is extremely rare. Mackenzie found it recorded but 3 times and Happich adds none to the list. We have found 1 additional case reported by Kirmisson in 1904.

The case which we desire to place on record belongs to the class of obliteration with tracheoesophageal fistula. The notes are as follows:—

Joseph Dorland, nine days old, was admitted to the Hospital of the University of Pennsylvania, December 7, 1907. The parents were living and well. Five other healthy children had been born. The patient was a full term infant, delivered with forceps after a somewhat difficult labor. Since birth he had never been able to swallow. After taking the breast for a moment he would become cyanotic, struggle as though strangling, and then eject milk and usually a large amount of mucus from the nose and mouth. Apparently no nourishment whatever passed into the stomach. There was no vomiting except after nursing. Very small bowel movements occurred about twice a day. There had been jaundice since birth. Examination on admission showed an extremely emaciated child. Attempts to feed it were at once followed by the regurgitation and strangling described. The child died a few hours after admission.

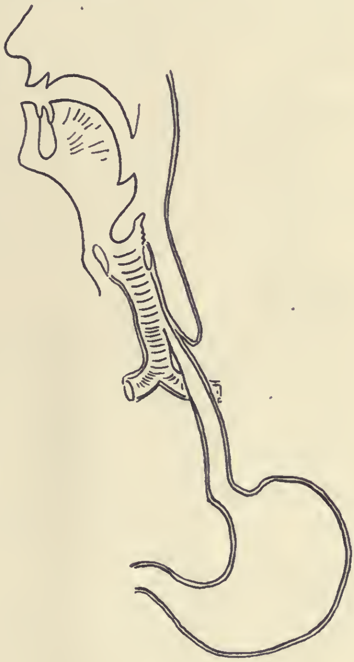

FIG. 1.

The autopsy revealed the body of a well-formed, emaciated infant. The features of interest in the examination of the internal organs were limited to the esophagus and the adjacent parts. The pharyngeal portion of the esophagus was slightly dilated, but otherwise normal to 4 cm. below the upper level of the larynx, where it terminated abruptly. The inferior portion was normal from the stomach upward to within a short distance of the termination of the upper fragment, where the lumen became narrower and, inclining slightly anteriorly, opened by a slit-like orifice into the trachea slightly above the level of the lower end of the upper fragment. The accompanying drawing (Fig. 1) gives a diagrammatic representation of the condition which the esophagus exhibited. An examination of the rest of the thoracic and abdominal viscera revealed no additional malformations or other pathological features.

Pathology.—Malformations of the esophagus doubtless arise in various ways, but in no form is the pathological explanation very certain and in some very unsatisfactory:—

Entire absence of the esophagus can occasion no surprise, as it is seen only in conjunction with other so extensive and serious malformations.

The occurrence of the *complete absence of only a portion* of the esophagus is very problematical, since, as already stated, some traces of esophageal tissue probably always remain. No satisfactory explanation for it seems to offer. Klebs's theory is that in the development of the respiratory organs from the gut-tract too much tissue was consumed at the expense of the esophagus, this resulting in a localized complete disappearance of the tissues of the latter. The cases in which more or less of the esophageal wall is evidently present in the form of a cord or band Kraus explains as resulting from a form of pressure-atrophy. He has observed 3 instances of this anomaly, in all of which there was compression of the obliterated area by an anomalous vessel. In 2 of them this was the right subclavian artery which arose as an independent vessel and as the last branch from the arch of the aorta, which lay behind the esophagus.

Simple fistula without other lesion is apparently the result of the persistence of the embryological communication between the primitive gut-tract and the cervical portion of the air passages. As this embryonic communication exists between the air passages at or just above the bifurcation of the trachea and the corresponding portion of the esophagus, the resulting fistula is practically always at this point.

Congenital *stenotic conditions* probably depend upon accidental changes in some part of the esophageal wall.

The greatest interest attaches to the pathology of the most common anomaly, *i.e., obliteration of the esophagus with tracheoesophageal fistula,* and the questions naturally arise, Why fistula is so usually combined with obliteration? Why the obliteration is always close to the position of the bifurcation of the trachea? and Why the fistula is always found in the lower fragment of the interrupted esophagus? The most satisfactory explanation of the mode of formation of this abnormality is that proposed by Shattock. According to his view, at the time when the pouch from which the lower air passages develop is formed from the anterior wall of the stomadeum, the posterior wall occasionally participates in the process sufficiently to be drawn forward, thus narrowing the lumen. When, subsequently, the lateral pouching for the formation of the larynx develops from the stomadeum just above this region, so much of the already narrowed lumen is consumed that the communication between the upper and lower portions of the esophagus is cut off and the lower fragment is left communicating with the air passages.

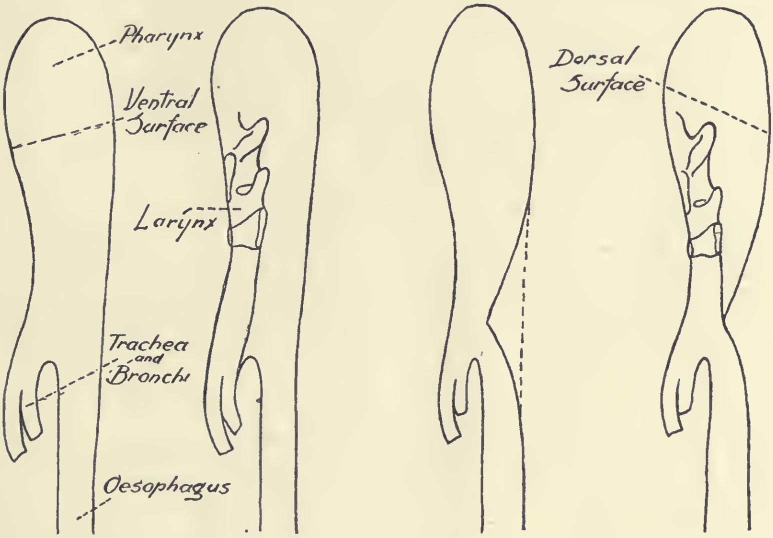

FIG. 2. FIG. 3. FIG. 4. FIG. 5.

Illustrating production of congenital obliteration of esophagus with formation of tracheoesophageal fistula. After Shattock.

The process can be probably better understood by a glance at the accompanying diagrammatic illustrations taken from Shattock's article. Fig. 2 represents the normal development of the lower air passages from the diverticulum on the anterior wall of the stomadeum, and Fig. 3 the development, from its pharyngeal extremity, of the larynx and upper part of the trachea. In Fig. 4 the abnormal kink in the posterior wall is seen opposite the diverticulum, and Fig. 5 illustrates the subsequent development of the larynx and upper part of the trachea dividing the esophagus into two portions, the lower of which remains in communication with the air passages.

Symptoms.—The symptoms of stenosis seen in infancy are similar to those observed later in life. The same is true of dilatation, whether congenital or following stenosis. We shall confine ourselves, therefore, to the symptomatology of congenital obliteration of the esophagus. The children with this condition may be well developed, but are often the subjects of congenital asthenia. Other malformations are very frequently present. From the time of birth there seems to be an unusual amount of mucus constantly expelled from the mouth. This is due to the fact that the oral secretion cannot pass into the stomach as it does in the case of healthy children. No food whatever can enter the stomach, and efforts at swallowing are attended by a prompt regurgitation through the mouth and nose of the food mixed with mucus. There are produced in this way violent suffocative attacks with severe cyanosis. Attempts at passing a catheter into the esophagus meet with the obstruction. Death takes place generally in the first week, exceptionally later, and depends in part upon the constitutional asthenia, in part upon the lack of food, and perhaps still more, as Happich points out, upon the drying of the tissues through lack of water.

Treatment.—This is entirely discouraging. Cases of stenosis have recovered, but all instances of complete obstruction have died. The weakness of the child and its early age make operative interference a questionable procedure. Yet gastrostomy offers the only hope. This operation was first done in the case of Steel, and has been performed since then in those of Hoffmann, Happich, Villemin, Kirmisson, and Dickie. The child should be kept on its side to allow the mucus to flow from the mouth. It may be fed through the gastric fistula. Should it recover, an effort may later be made to repair the esophagus by a lateral operation in the neck. This indeed was attempted unsuccessfully in Hoffmann's case as a primary operation, and gastrostomy resorted to later.

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A CASE OF SPASMODIC STRICTURE OF THE ESOPHAGUS.*

BY SAMUEL S. ADAMS, M.D.,
Washington, D. C.

On the afternoon of February 17, 1907, I was called to attend A. X., aged six months, white, female, born in this city. The following history was obtained:—

Parents living and in good health. No history of neurosis in either. This their only child. The child's birth was normal and she was nursed by the mother for one week, when various "infant foods" and "milk mixtures" were "tried," but she did not get on very well and was troubled with "sour stomach." Has had no "serious illness."

About six weeks ago she began to have difficulty in swallowing food. At times the slightest amount would be returned, accompanied by considerable mucus, for several feedings, and then she would retain all food given for several days until "another spell occurred." During the periods of returning the food it did not seem to come from the stomach as it was not completely swallowed. She never vomited blood. Mother declares long naps or exposure to drafts were invariably associated with the attacks. Parents were certain the infant had never swallowed any caustic, or foreign body; nor had she ever been given any sleep-producing drugs.

The attacks have become less frequent and less severe, the last being on the 13th of this month. She "does not seem to have lost any weight," although she weighed 9 pounds at birth and at present weighs 8 pounds 5½ ounces. About two weeks ago her feet and ankles began to swell, but this soon disappeared. Has been more or less constipated since birth.

The last feeding was at 1 A.M. to-day.

General Examination.—Expression anxious; of average height; weight below average; nutrition poor; anterior fontanel very large and depressed; veins of the forehead distended; intelligence average; no teeth; restless; no eruption; temperature normal.

The cutaneous, muscular and osseous systems apparently normal. Slight enlargement of the inguinal glands. Lips and gums dry, tongue slightly coated; abdomen slightly distended; constipated.

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* Read at the Twentieth Annual Meeting of the American Pediatric Society, at Delaware Water Gap, Pa., May 25, 1908. Discussion on page 175.

Considerable mucus in nose and mouth; otherwise respiratory system normal.

Circulatory system normal.

Genitourinary system normal.

Infant fretful and cries a great deal, but there is no history of convulsions or other nervous manifestation.

There is no evidence of rickets; nor could any symptom of laryngismus stridulus be elicited.

It was now seventeen hours since the child had swallowed food, and, as she was both thirsty and hungry, I directed the father to give her some cool water. She swallowed two teaspoonfuls and then refused to take any more. In two or three minutes she began to gulp and gag; at first the water came back into the mouth and was again swallowed; then water and mucus; and finally, after probably a dozen attempts to get it down, the water and as much mucus was ejected.

I was sure of an obstruction in the esophagus, and expressed the belief that it was spasmodic in character. At my suggestion the infant was taken to the Children's Hospital, D. C., at 9 P.M., and was seen by Dr. J. R. Wellington, the surgeon, and me.

Dr. Wellington tried to pass an ordinary sized feeding tube, but it met an obstruction just above the stomach which it would not pass; a smaller catheter would not pass; finally a No. 10 French catheter with stylet was gently pushed by the obstruction into the stomach. Through this was passed four ounces of a suitable milk mixture, which was retained.

During the night nutritive enemata were given, but were not well retained.

February 18th.—She had rather a restless night; vomited a small quantity of bilious-looking fluid, after which she felt better. She was placed on the table for the purpose of having the tube passed, when Dr. Wellington directed the nurse to give her some milk that he might see how she acted or swallowed. He was greatly amazed to see that she swallowed and retained the full amount of nourishment, and went to sleep.

This sudden improvement aroused a suspicion that some foreign body might have been pushed into the stomach the previous night, but nothing unusual was detected by the X-ray.

The infant took eagerly and retained its nourishment for the next four days and gained in weight.

February 22d.—Dr. Wellington passed with some difficulty a No. 18 soft rubber French catheter. The doctor thought that if he passed the catheter quickly it met with less resistance than when he passed it slowly.

February 23d.—She was taken away by her parents and was in much better condition than when admitted.

May 30, 1907.—I have indirectly followed the history of this case, which has continued to have the attacks, but less frequently than before the tube was passed. A few days ago I learned from the father that she was now having attacks about every two weeks and that they only lasted an hour or two. He said his wife thought that the infant would overcome the difficulty in swallowing when she would startle her by a shout or a clap of the hands.

May 4, 1908.—During the past year I did not attend the child but frequently saw her in the carriage. On inquiry from time to time I learned that there was not much improvement, although she grew slowly and had learned to walk and talk. To-day, as I was about to enter the Georgetown University Hospital, the father stopped me and wanted me to do something to relieve his child, as she had not swallowed a thing for twenty-four hours and had cried most of that time, so that her mother and himself were about worn out. He pulled from his pocket several metallic sounds and suggested that they could be used. I declined to treat the child, but advised him to consult a surgeon at once.

May 5, 1908.—About 6 P.M. the father telephoned to me that his child was very ill; that the surgeon had passed the sounds that morning; that she had "cried with pain" all day; and that she now had considerable fever. I told him to ask one of the internes to see her and report to me. Two hours later he urged me to see the child and I did so. Her temperature in the rectum was 104° F., pulse 170 and respiration 70 and labored. I made a diagnosis of bronchopneumonia, but was accused of trying to shield the surgeon. At midnight the father telephoned that she was worse, so I requested a physician in the neighborhood to see her, but she was dead when he reached the house. The next day I signed the death certificate, giving bronchopneumonia as the cause of death, but, owing to the abuse heaped upon the surgeon and myself by the father, I withdrew the certificate and reported the case to the coroner. Below is his report:—

May 6, 1907.—12 M. White, female, aged one year nine months; weight, 22 pounds. (?)

Previous History.—Symptoms of stenosis of the esophagus. Body had been embalmed. General nutrition good. Slight pallor. Brain not opened. Lungs: Several areas of red hepatization throughout the left lung, lobular condition. Several bronchial glands markedly enlarged. Hypostasis posteriorly on both lungs. Heart, spleen, kidneys, urine, liver, gall-bladder, pancreas, stomach, intestines and genital organs normal.

Esophagus: five inches above cardiac orifice of stomach marked narrowing (circular) of the tube; appeared as an induration between the walls, markedly uniform. The condition of induration extended upwards one inch. Immediately adjacent to the induration on the left side was found a bronchial gland about the size of a chestnut which was pressing inwards upon the tube.

Microscopically the gland appeared to be tuberculous. At the beginning of the normal tube, above stenosis on left side, a well-defined diverticulum was noted, which was about the size of a No. 10 bird-shot. A perforation into the mediastinum, with a blood-clot, was found. Just below stenosis area on anterior wall two other diverticula were noted, about the size of the one described, their walls being very thin, consisting only of the external coat.

The specimen was given to the pathologist, who pronounced the glands to be tuberculous, but repeated efforts to get a complete report from him have failed.

As neither food nor foreign substance was found in the mediastinum, the perforation had nothing to do with the child's death. On the contrary, I believe the pneumonia, the cause of death, was due to the inspiration of food and antedated the passage of the sounds on the morning of her death. This opinion is strengthened by the fact that on the preceding day her father reported her condition as being serious and, from a casual observation, his statement was accepted.

Dr. Prentiss Willson examined the literature at the Library of the Surgeon-General's Office and could only find 1 case that resembled the above. The following is an abstract of an article by Méry* on "Spasms of the Alimentary Canal in Nurslings."

These spasmodic conditions may attack the pylorus, esophagus or cardia. Sometimes the cause is intoxication, in other cases nothing but a nervous element can be given as the etiologic factor. After mentioning 3 cases of pyloric spasm, he continues as follows: Instead of attacking the pylorus, the spasms may attack the cardia or esophagus. *This is exceptional.* Comby, in his "Treatise on the Diseases of Childhood," does not mention the occurrence of esophagism before the seventh to tenth years. The case now to be described is that of a little girl ten months of age, breastfed for the first three months. No trace of nervous manifestations in the parents. In the fourth month, without previous digestive infection, the child was taken with an attack of asphyxia of great severity, nutrition became bad and during the interval of five months, from September to February, the increase in weight was only 500 grams. Three developed attacks of forcible vomiting, following *immediately* the ingestion of fluids, accompanied by slight laryngeal stridor and some hiccough. During this time the child slept well, the stools were normal and she had no fever. Glairy mucus streaked with blood, was occasionally rejected with the milk. Various diets and therapeutic agents were tried without avail.

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* *Rev. gen. de clin. et de Therap.*, Paris, 1906, XX. 51-53.

After giving the child milk of bismuth, radioscopy showed a black mass above the stomach, and in about thirty seconds part of it could be seen entering the stomach, and the remainder would be rejected. By introducing a rigid sound gavage was attempted, but the stomach contracted so on the eye of the instrument that it was necessary to use a syringe and considerable force to inject the milk. The child was isolated, taken from its mother, and put under the care of a nurse. It soon developed a general edema, spasms of the glottis and convulsive twitchings of the right side attributed to edema of the brain, but ultimately recovered. Méry considers the esophageal spasm as possibly attributable to the ingestion of air while sucking the thumb, a habit to which the child was addicted. He thought that the attacks of esophageal spasm decreased in frequency when the infant was prevented from sucking its thumb.

Although Méry's case resembles in some respects my own nevertheless, one must conclude, from his description of it, that it is a good picture of laryngismus stridulus in a rachitic infant.

The infant in my case used the cotton-plugged nipple as a pacifier and the father says that I suggested that it might have had something to do with the attacks, so they stopped using it.

1 Dupont Circle.

DISCUSSION OF PAPERS.

Augustus Caillé, M.D., New York.—In connection with Dr. Adams' case, I would report a somewhat similar one; a lad of ten, who is now under my observation, the son of a physician, has had a spasmodic stricture for five years. Five years ago careful examination elicited the fact that there was no diverticulum—it was purely spasmodic. The stricture came on gradually and the inability to swallow was such that the boy was moribund from starvation. There was no difficulty in introducing the usual calibre tube and he was fed in that way. After some time he became able to swallow and was taken home. The father is still compelled once or twice a week to use the tube for feeding him.

This lad had hydrocephalus in his infancy and I imagine the irritation is of central origin, and I doubt if it will ever get entirely well.

In this connection I would sound a note of warning regarding the examination of the esophagus by means of the sound or esophagoscope. I have recently seen a young girl, who had some difficulty in swallowing, who was examined with the esophagoscope by an expert stomach specialist. He ran the instrument into the left pleural cavity, a pneumothorax developed and she was dead in two days.

C. P. Putnam, M.D., Boston.—I should like to mention a case similar to Dr. Griffith's; a boy twelve days old, with the history of not having swallowed anything since birth, was brought to the Massachusetts Infant Asylum. A solid obstruction having been found four inches from inside the lips, a gastrostomy was performed successfully by Dr. J. S. Stone. The baby rallied well after the operation and received a little milk with a tube through the wound. The stomach had plainly been empty up to that time. Doubt was thrown upon the diagnosis of obstructed esophagus when next day the baby vomited some milk, but this was explained by the autopsy. On the second day it failed and died.

The autopsy by Dr. Robertson showed that the esophagus ended in a blind pouch a little above the bifurcation of the trachea. The milk introduced into the stomach had been vomited up through the trachea. The child had some consolidation in the bases of both lungs.

Thomas Morgan Rotch, M.D., Boston.—This opens up a rather important point in regard to the differential diagnosis in these cases, especially since we have had in late years much added information in regard to pyloric stenosis. Some of these cases of constriction of the esophagus simulate very closely pyloric stenosis. It is rather curious that they are almost identical so far as the rational signs are concerned. The food will sometimes be kept down for a day or forty-eight hours and then vomited. There is danger in passing the sound because sometimes at the lower part of the esophagus there is a thinning of the wall in these cases. I have had a careful autopsy made on one where there was congenital stenosis just at the entrance to the stomach and above that a ballooning of the esophagus from stretching. In the lower part of the sac there was a very thin place about 1 cm. in diameter which was about to rupture into the trachea. The least mechanical interference would have ruptured it before death. We know that in a certain number of these cases we do not find anything on physical examination, although our recent examinations, especially with the Roentgen ray, have aided very much. These cases also simulate closely cases of chronic gastric indigestion, so that the greatest care should be used, before employing any other method, to carefully regulate the diet so as to determine whether or not they are cases of indigestion.

A. Jacobi, M.D., New York.—What was the exact site of the constriction in Dr. Griffith's case?

Dr. Griffith.—Just above the bifurcation.

Dr. Jacobi.—It is that position which gives rise to a great deal of difficulty in the adult. Carcinomata of the esophagus are apt to be found in just that position. The cause, I think, must be looked for in embryonal conditions. It is with the esophagus just as with the rectum; there may be just such overlapping. The parts are formed separately and as a rule will meet one another and so the tube is formed, but in this neighborhood there is always a narrowest part. We find that when we introduce a large sound into the esophagus of a healthy person, there is apt to be some constriction and it must be explained by the nature of its embryonal development. In the rectum we find it more frequently perhaps, so frequently that every one of us may have found such a deformity of the rectum that when you mean to open such an imperforate rectum in a newborn by operation it may happen that you find these parts improperly developed so that the trochar runs into the peritoneal cavity in place of into the upper part of the rectum. It is the seat of predilection for cancer even in late life. Such a case of unsuccessful operation for imperforate rectum I published in the *American Medical Journal* of 1861.

As to the diverticuli they may be explained by something that happens a good many times. The muscular layers of the intestinal tract are not uniformly developed. Defects of these layers are quite common. That is the case in the sigmoid. Diverticuli formed below the constriction must be explained in that way. The muscular layers in these places are incompletely developed. Certain places imperfectly developed are found throughout the whole intestinal tract and the upper part of the apparatus is no exception.

Samuel S. Adams, M.D., Washington.—I would state that there was no fluid found outside of the esophagus in the surrounding tissue, nor was there anything in the bronchial tubes, and yet I believe the pneumonia was probably the result of inhalation of some of the food that the child had been trying to take.

A CLINICAL STUDY OF THE TRANSMISSION AND PROGRESS OF TUBERCULOSIS IN CHILDREN THROUGH FAMILY ASSOCIATION.*

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AND

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Boston, Mass.

FROM THE CLINIC OF THE BOSTON CONSUMPTIVES HOSPITAL.

The solution of any great problem vitally affecting the welfare of the Nation should be applicable first to the home, that unit of national foundation. Where the home is menaced, the State is always endangered. Tuberculosis invariably has been a disease of the household, a fact the more true with the fast growth of municipal communities. Not only is it a distinct danger to the family, but from the very nature of its chronicity an enormous economic loss to the community.

In endeavoring to control tuberculosis proper consideration should be given to the child. It is frequently the children of today that are the consumptives of to-morrow, being handicapped by heredity and exposed through family associations. The problem, therefore, must be large enough to embrace the sick and the endangered as well. The work in Boston has included not only the phthisical patient, but also his family. Records of the public charities and hospitals have been searched in quest of cases of tuberculosis. Where disease has appeared within the past four years the household has been visited and investigated, and again and again the need of medical supervision has been most apparent. In this way the incipient case has been discovered, predisposition controlled and the well retained in health.

Influences Favoring Infection in the Child.—The effect of tuberculosis on the mortality of early years shows its influence to be greatest during infancy. This death rate, after repeated observations, appears to decrease slowly as the child grows older. Susceptibility is at its height in this early period, and where a predisposition through heredity is added to a soil not unfavorable for the growth of the disease the chance of infection is vastly increased.

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* Read at the International Congress on Tuberculosis at Washington, September, 1908.

Children are peculiarly susceptible to unhygienic surroundings. Over-crowding, lack of fresh air and sunlight, dirt, neglect and improper food, natural environments of the majority, merely increase the normal low resistance of the child at this period.

The influence of measles, whooping-cough and influenza are known to have a powerful predisposing effect in contracting tuberculosis. The activity of the lymphoid tissues of the body in early life and the onset of puberty are likewise physiological phenomena of considerable importance.

It must not be forgotten, however, that the habits and characteristics of the child in daily life have an important part to play. The close intimacy of child with child, its parents and neighbors, in school and at home, materially aid in the spreading of the disease.

The mere presence of tuberculosis in the household is of the utmost importance to the welfare of the child, for in each home, even where cleanliness of person and health of the consumptive are ideal, there is still a minimum amount of danger of infection. On the other hand, where carelessness and ignorance abound, contagion is not only probable, but very frequent.

Modes of Infection.—The modes of infection must necessarily be various, and frequently multiple, where we deal with constant exposure to disease. Infection by transmission through the aural passages has been with us a negative quantity. The two great paths of infection, ingestion and inhalation have contributed greatly without doubt, but which manner of infection occurred in an individual case was impossible to determine.

In our study of 1,000 children it appears that whatever the mode of entrance might have been, probably direct transmission of the disease from parent to child was the most important factor. Of these cases 679 have been in immediate contact with tuberculosis in the home. Of this number 36 per cent. showed definite signs of pulmonary consolidation. This type of infection has been strikingly demonstrated in a large number of instances. Following one open case of tuberculosis in a parent, evidence of the disease was found in all but 1 of 5 children. Not only in one, but in many families has this been found true.

The respiratory tract is not the only vulnerable point in the youthful organism to be attacked. The lymphoid tissues of the throat, adenoids and tonsils especially, present a very favorable point of entrance for the tubercle bacillus. They aid directly in the transmission of the disease and by obstructing the upper air passages favor the production of pulmonary tuberculosis through improper breathing.

The systematic laryngoscopical examination of our cases shows about 50 per cent. (some 493 children) to have hypertrophied tonsils, while only operable adenoid growths appeared in 14.5 per cent. (some 145 children). Tonsillotomy and adenoidectomy, even when imperative, were necessarily rarely performed on account of popular prejudice. Of the few operated on no tubercles were demonstrable pathologically in the tissues removed.

In only 11 instances did infection point to the glands of the neck, and of this number only 5 showed pulmonary involvement. In regard to the localization of infection in bone or joint, except for 4 cases of tuberculosis of the hip and 1 of the finger, this type of infection has been wanting.

Invasion of the serous cavities (the peritoneum and meninges) was discovered in only two or three instances. This is of interest when we note, from the report of a small phthisical hospital, that 11 children out of 24 born of tuberculous mothers died of tubercular meningitis.

Incidence.—The early detection of intrathoracic tuberculosis in the infant or child is frequently one of extreme difficulty. Frequently the actual condition in the lungs is only suspected, and a positive diagnosis is not made until lesions are extensive or general miliary disease supervenes. The explanation of this state of affairs lies in the peculiar anatomical condition in the chest of the child, where the pathological process must be of relatively large extent to be evident. The chronic sore throat, persistent laryngitis with its cough, so frequently occurring in the children of the poor, withdraws attention from the lungs. The presence of pulmonary disease is frequently obscured by the presence of measles or pertussis. The non-appearance of sputum is a serious handicap. With children under constant supervision this difficulty may be obviated as shown by Holt, but the dispensary clinic cannot so readily profit by the swab method. We have been able to collect sputum in only 62 of these cases, and in only 3 of these were bacilli present.

An accurate estimate of the extent of pulmonary tuberculosis in early life is difficult to obtain and wide diversity of opinion exists in regard to it. Morse says that pulmonary lesions are comparatively rare before puberty, but are of more common occurrence in childhood than in infancy. Squire says of phthisis in the United Kingdom, that it is the most common and fatal of all diseases of infancy and childhood. The Registrar General's report for 1903 for England and Wales showed a total of 16,650 cases. On the other hand, systematic examination of school children in London has shown that among 1,670 only 8 showed signs of phthisis, or .47 per cent., and when those with doubtful signs were taken into account it made a total of 1.3 per cent. Mackensie found 18 cases in 600 school children in Edinburgh, and Robertson found 6 cases among 806 in Leith. Leubuseber found 2 cases in 1,400 school children in Germany, while Grancher, in Paris, found some 15 per cent. of 4,000. Two hundred and twenty-six children gave evidence of glandular or pulmonary tuberculosis. This author also finds about 25 per cent. of children of tuberculous parents are tubercular or so predisposed. These results were obtained in the examination of the average school child, the majority being apparently well and not exposed to the disease.

In some 679 children drawn from the poorest homes of Boston, of which about 570 contained living consumptives, and in 179 others there had been recent deaths from the disease, there were definite signs of pulmonary involvement in 36 per cent. More than 66 per cent. of the entire number showed signs or symptoms of the disease. In 321 children living in poverty and neglect brought for examination on account of suspicious symptoms, about 30 per cent. were looked upon as tuberculous, although not directly exposed in the home.

In regard to postmortem statistics, J. Comby has published reports from the hospitals of Paris, showing that 38.5 per cent. of the children examined showed tubercular lesions. Muller, in Munich, found 43 per cent. out of 500 examinations; Hamburger and Sluka discovered 41 per cent. in 401 postmortems in children under fifteen years of age. These figures apply to tuberculosis, occurring anywhere in the body in children dying from various causes. Hamburger's tables showed that pulmonary infection was present in 50 per cent. of the cases and the bronchial glands were involved in 98 per cent. In all necropsy reports, however, it should be remembered that many more are never discovered in life. These reports are taken from general hospitals. If autopsies could be obtained on a series of children such as we have had under observation, very few would probably be found free from tuberculosis. It is interesting to note that the total percentage of cases showing pulmonary tuberculosis at necropsy closely tallies with our records of cases diagnosed as pulmonary tuberculosis.

Other Factors Influencing Infection.—As the question of how large a part is played by milk in the production of tuberculosis in children especially, McCaw calls attention to the fact that of 26,193 cases under treatment for various disorders in Belfast, 20 per cent. under five years showed tuberculosis, and of these 40 per cent. were of the surgical type (bone and glandular). In other English cities, as London and Manchester, also in Glasgow and Edinburgh, the predominance of surgical tuberculosis treated in hospital clinics has been marked. McCaw further states that the general concensus of opinion is that surgical tuberculosis is generally of the bovine type, and that the bovine and human infection do not commonly occur in the same case. With us, where infection was probably due to the human type in the great majority of instances, every opportunity of infection being at hand, only 11 cases of glandular tuberculosis and 5 of bone infection occurred. It must be remembered that these were not selected cases, only in so far as every exposed child possible was examined. Why then has it happened that the surgical types, bone and glandular forms, have been so infrequent? This question we cannot answer, unless we take the position that surgical tuberculosis is produced by the bovine bacillus, while in our cases the human type of infection has been reproduced by direct transmission.

Concerning the period of latency of phthisis in children, it would seem, from a number of observations, that following direct exposure a few months only intervened before active signs and symptoms appeared. In others, however, the intervals have been considerably longer. The great difference of susceptibility to tuberculosis in different children has been very noticeable. Even in similar surroundings and exposed for the same period of time they vary much in this respect. The size of the cardiac area in its relation to the development of phthisis is often important. In the measurement of some 800 children our results were remarkably uniform, both as to age and development. In a very few the cardiac area was distinctly undersized. Even in the poorly developed and nourished the heart did not seem to have suffered in development. Valvular lesions were infrequent, only 10 cases of mitral regurgitation and 2 of mitral stenosis being present.

Type of Disease, Infant or Adult.—The grouping of the lesions of tuberculosis into the infantile and adult types (which is so commonly seen in hospital clinics) has not been observed by us. In any large children's hospital two types of tuberculosis are common, the general disseminated and the chronic phthisis of the adult. The latter group, chronic phthisis, includes practically all of our cases, only two instances of general miliary tuberculosis being detected, one of which was proven at autopsy. What this means in regard to individual susceptibility we do not know. In these cases, perhaps, infection has been in small repeated doses, and the stimulation of body resistance thereby has prevented diffuse lesions. Be this as it may, the great preponderance of the adult type of lesion is certainly noteworthy.

Symptoms and Signs.—Many a child with few or no symptoms will, in the study of a phthisical family, show on examination real evidence of tuberculosis in some portion of the body. The acute respiratory symptoms often following measles or associated with the common cold will often be overlooked, and later a semi-quiesent pulmonary lesion be discovered. With the repetition of colds and sore throat, from neglect or bad nasopharyngeal conditions, the pulmonary process may light up and, increasing in extent, make itself apparent. The presence of languor, pallor, loss of strength and appetite, are first noted. Night sweats are frequent, loss of weight rapid, and cough frequently constant and distressing. Hemoptysis is uncommon. Slight evening pyrexia is most significant. Cough, however, is so common in the child that too much weight must not be placed upon this symptom. Young examined some 337 children under fifteen years of age in trying to estimate other etiological factors for cough besides pulmonary tuberculosis. Of this number only 45 showed pulmonary lesions.

In our list of 1,000 cases some 262 showed involvement of one or both apices of the lungs. In about 100 others the lesions were equally divided between the middle and lower lobes. The extent of the lesion varied greatly and apparently had little connection with the length of exposure to infection. Very few lesions had advanced to cavity formation, and where the disease was extensive the process generally took the type of acute bronchopneumonia with septic maifestations.

Diagnosis by Various Means and Their Value.—The younger the child the more difficult it is generally to diagnose the lesion, especially in its incipient stage. A careful consideration of the family history, clinical symptoms and signs is imperative in order to arrive at a correct conclusion. In the differential diagnosis of chronic pulmonary lesions the group of symptoms and signs in children may be closely simulated by a number of conditions. Phthisis and asthma may frequently be associated, and we should not be misled by the more evident process. The diffuse catarrhal lesions in the lungs, the expiratory distress and characteristic sputum, if it can be obtained, may aid us in the detection of the latter. The symptoms following acute nasal and throat infections are often confusing, and unless the upper air passages are studied the diagnosis may long be uncertain. The cough in tonsillar hypertrophy with nasopharyngitis, expectoration of mucus, general debility and loss of strength, often make it impossible to exclude a beginning pulmonary lesion. When tuberculosis of the bronchial glands is present with night sweats, cough and dyspnea, in addition, perhaps, to local signs at the upper portion of one of the lungs, it requires time to settle the question whether the lesion is pulmonary or otherwise. The recurrent attacks of bronchitis often are followed by phthisis and may later hide it. Even after we have learned all that clinical methods can tell us many conditions will be obscure and laboratory methods will be demanded. Repeated examination of the sputum, when it can be obtained, will often aid, and occasionally tubercle bacilli will be found when the pulmonary examination is negative. Where the laryngologist is at hand this may be collected from the larynx on a swab. In older children, with training and the aid of an expectorant, sputum can be obtained in a considerable number of cases. The use of the stomach tube to get swallowed mucus will probably be a method mostly confined to hospital practice. The use of tuberculin will be of real value and may stamp many a doubtful case as tuberculosis. The use of tuberculin subcutaneously is the most accurate diagnostic means we have, and its prompt and definite reaction, general and local, will tell us not only that the case is tuberculosis but often where the process is located. The use of the cutaneous and ophthalmic reactions we have found of great value, especially on account of their simplicity. With the cutaneous reaction there are rarely any constitutional symptoms and no dangers. It is generally reliable in its results, but in how large a percentage of cases of tuberculosis a positive reaction occurs is still undetermined. Engel and Bauer, having used the cutaneous reaction on some 300 cases, conclude it is of great diagnostic value. Our use of the ophthalmic reaction has been of value in confirming our suspicions in a number of cases as to the presence of tuberculosis. With the increasing number of reports of injury done to the tested eye, and since in our experience we have had 3 cases of phlyctenular conjunctivitis, we have relied on the other method of administration. In a number of cases we have used both methods and found them frequently to give identical results, and then again one was positive and the other negative. In 14 instances where the cutaneous reaction was negative the ophthalmic was positive. In 73 children giving a negative examination, 30 gave a positive tuberculin reaction. In 174 children suspected of tuberculosis, 112 gave a positive reaction. We feel that our use of these newer methods of giving tuberculin as an aid to diagnosis has been of value in confirming our suspicions in many a doubtful case, and in leading us to place more value upon slight signs and symptoms.

The use of the X-ray, in conjunction with these other measures, has been of great value, especially as we have had an expert to interpret our radiographs. We have learned that the most careful examination will fail to detect the true extent of the tubercular process and one that appears well localized may be very diffuse. Not one, but all means and agencies at our disposal have been used in attempts to reach a decision. Even then, time and repeated observations have been necessary.

Treatment.—In our community, while the educational movement is rapidly making progress in regard to tuberculosis among all classes of people, the full realization of our duty to children has not been appreciated. No adequate provision has yet been made to place these children in good environment that they may regain their health. The work of removing the infected member of the family is being well worked out, but until we can care for all the ignorant and careless consumptives our problem in regard to children will continue to be a large one. Much, however can be done through isolation, education and cleanliness. A considerable number of children we have had under observation in day camps and in the country. The results have exceeded our expectations. Not only has the general improvement been rapid, but a number of active lesions have become quiesent after a few weeks treatment. It would seem that the child at its receptive age is peculiarly open to ideas in regard to hygienic living, and the recuperative power of the body at this stage in development gives great promise of successful results in treatment.

Prophylaxis.—In order, then, better to protect our children several measures are important:—

(1) Early notification of all births.
(2) Better inspection and control of the milk supply in cities.
(3) Systematic school inspection.
(4) Housing reform.
(5) Segregation of advanced cases.
(6) Required notification of the disease.
(7) Provision for the care of pulmonary tuberculosis in children.
(8) Education of all school children on matters of general hygiene.

Nearly all these measures are being enforced in Massachusetts, and as the forces of sanitation and education advance the solution of the problem of tuberculosis is nearer.

STATISTICS.

Number of Children.

Boys	475
Girls	525
Total	1,000

Ages of Children Treated.

One year and under	35
Between one and five years	249
Between five and fifteen years	716
Total	1,000

Total exposed to tuberculosis in the home	679
Total not exposed to tuberculosis in the home	321
Total	1,000

Family History.

Homes with living phthisical patients in them	500
Homes with history of a death from phthisis in four years	179
Homes with a negative history	321
Total	1,000

Group A—(Children under One Year of Age).

DIAGNOSIS.	
Negative	27
Pretubercular	1
Bronchitis	6
Miliary tuberculosis	1
Total	35

PHYSICAL EXAMINATION.	
Negative	28
Catarrhal	7
Consolidation	0
Total	35

Of these 35 only 25 were exposed.

Group B—(Children from One to Five Years of Age).

DIAGNOSIS.	
Negative	152
Pretubercular	12
Tubercular	10
Bronchitis	27
Phthisis ?	39
Phthisis	9

Total .... 249, of which 171 were exposed.

PHYSICAL EXAMINATION.	
Negative	174
Signs of consolidation	39
Catarrhal signs	36
Total	249

Group C—(Children from Five to Fifteen Years of Age).

DIAGNOSIS.	
Negative	326
Pretubercular	50
Tubercular	49
Bronchitis	43
Phthisis ?	210
Phthisis	38
Total	716

PHYSICAL EXAMINATION.	
Negative	424
Signs of consolidation	222
Catarrhal	70
Total	716

Of these 716 only 481 were exposed.

Physical Examination Continued.

Throat.	Hypertrophied tonsils in	495
	Adenoids in	145
Heart.	Mitral regurgitation in	10
	Mitral stenosis in	2
Lungs.	Location of Lesions.	
	Apical lesions in	262
	Lower and middle lobes affected in	100

Tuberculin.

Children with negative examinations	Positive.. 30	Negative.. 43
Children suspected of tuberculosis	Positive..112	Negative.. 66
Total of 251 cases, of which	Positive..142	Negative..109

N. B.—Explanation of our nomenclature.

"Pretubercular,"	patients having tubercular symptoms with negative examination.
"Tubercular,"	patients having tubercular symptoms and tuberculin reaction.
"Phthisis ?,"	patients having tubercular symptoms and signs of pulmonary consolidation.
"Phthisis,"	patients having tubercular symptoms and signs associated with positive sputum or tuberculin reaction.

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ABSORPTION OF FAT BY INFANTS.—Schelble (*Deutsche Medizinische Wochenschrift,* Vol. LV., No. 10, p. 489) describes a simple method with which he was able to supervise the extent and time required for absorption of fat in infants, and tabulates his findings in 100 tests. He regards the hemoconias or "blood dust" seen in the blood with the ultramicroscope as consisting of particles of fat, and notes that the turbidness of the serum is proportional to the number of these fat particles. He never found this blood dust in fasting children nor in those fed exclusively on oatmeal gruel. A simple drop drawn from the great toe is enough for the test. The absorption reaches its highest point between the second and third hours, and examination of the blood at this time will show the extent of the process in the child in question. It is dependent on the age and condition of the child, the amount of fat ingested and the length of the interval since the meal. Comparison with a normal standard gives the best oversight of the conditions, especially with a graduated series of standards showing different grades of turbidity. The findings in his tests showed that the fat ingested seemed to be evenly distributed through the blood, both in adults and in infants. The simple technic allows instructive oversight of the infants' capacity to absorb the fat ingested, and thus to regulate the diet to correspond to the individual needs and avoid accumulation of undigested fat in the digestive tract.—*Journal of American Medical Association.*

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THE ARTIFICIAL FEEDING OF INFANTS.*

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The percentage method of feeding has been successful to a degree during the past decade because it employs clean milk and tries to adapt the milk to each child's digestion. But it is, at best, an empirical method, which tries to make the age of an infant the starting point of its calculations and percentages its goal. This is unscientific. Infant feeding can be placed on a positive scientific basis if we will treat it the same as any other branch of dietetics.

In selecting the diet of an adult we determine the number of calories required to supply the necessary energy and to maintain his nitrogen equilibrium. Voit, Pettenkofer and others placed the requirements of an average adult between 35 and 40 calories per kilogram of weight. But there is a certain loss of nitrogen that can be replaced by nitrogenous food only, and so man needs a definite amount of proteids. This has been found to be 1.3 to 1.7 grams for each kilogram of weight. Infants have a larger body surface in proportion to their weight than man, and so they need a greater number of calories per kilogram of weight. Heubner and Rübner actually determined the caloric value of the food of healthy nursing children and found it to be 90 to 100 calories per kilogram in the first six months and 80 to 90 in the second six months. They came to the conclusion that artificially fed infants should receive about 20 calories per kilogram of weight in addition, on account of the extra energy required to digest this food and its incomplete absorption. Likewise, in regard to the proteid requirements of infants, we would expect that this would be greater than in adults, because in infants we must not only maintain organs, but develop them—the body is growing. Dr. Allen, by various analyses, determined that the minimum proteid requirement of the growing infant was .6 grams per kilogram of weight in the first week, 1.2 grams per kilogram in the second week, 1.8 in the third, 2.1 in the fourth, then 2.4 until the sixth month, and 2.7 from then until one year.

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* Read before the Newark Medical League, September, 1908.

Here we have two factors, the number of calories per kilogram of weight and the minimum proteid requirement in grams per kilogram of weight, that must form the basis of any scientific system of feeding, whether it be infant or adult. Without a consideration of these factors, our feeding is but experimental empiricism.

The total quantity of food fed to an infant can be varied within the limits of the infant's desires and its gastric capacity. The quantity of modified milk need not affect the number of the total calories fed, but changes the percentages of the various ingredients from which these calories come. For example, if an infant weighing 8 kilograms (17.6 pounds) is fed on an energy quotient of 100, *i.e.*, 100 calories for each kilogram of weight, it must receive 800 calories in its milk—the larger the quantity of food, the more water is added, and so the milk is diluted and the percentage of the various ingredients reduced. Through the autopsies performed by Holt, we know the gastric capacity of the infant's stomach at different ages. This capacity, multiplied by the number of feedings to be given in twenty-four hours, gives the total quantity of food to be fed in one day. We can also learn the capacity of each infant by the quantity of food it requires to satisfy its immediate hunger. According to Holt's findings, the gastric capacity at different ages is as follows:—

Birth	1	ounce.	5 months	5.5	ounces.
2 weeks	1.5	ounces.	6 “	6.	“
4 “	2.	“	7 “	7.	“
6 “	2.25	“	8 “	7.5	“
8 “	3.	“	9 “	7.5	“
10 “	4.	“	10 “	8.	“
3 months	4.5	“	11 “	8.5	“
4 “	5.	“	12 “	9.	“

With these positive factors, we can construct the particular food for each infant that is not only digestible, but also supplies the proper number of calories and the proper amount of proteids for its growth and development.

In the so-called percentage method, some have said for a child of such and such an age we must feed this percentage of proteids and that percentage of fat; others have said we should feed more fat and less proteid; others more proteid and less fat. Each pointed to his good results to justify his position. These two wings of the percentage method of feeding could never convert each other because they both ignored what really determined the success or failure of their feeding—the weight of the child and the quantity of modified milk of the particular percentage they were feeding. Let us see how we proceed to feed an infant according to the caloric method.

Let us say the child is three months old and weighs 11 pounds or 5 kilograms. If we give an energy quotient of 100, that is, 100 calories for each kilogram of the child's weight, and the child weighs 5 kilograms, we must supply 500 calories in the milk. A certain portion of these calories must be supplied by the proteids of the milk, that is, for every kilogram of weight the child needs 2.4 grams of proteids. The child's weight being 5 kilograms, it must receive 12 grams of proteids. The percentage of proteid will now depend on the total amount of food fed in twenty-four hours. For a child three months old this is usually 36 ounces, or 1,056 grams. The percentage of proteid is found by dividing 12 grams of proteids by the total quantity, 1,056, which gives 1.13 per cent. This is the smallest percentage a child of this weight and receiving this quantity of food could be given and maintain its growth. But if the quantity changes, the percentage will change even though the total amount of proteids fed remains the same. This shows the error of advising certain percentages of proteids for certain ages. The percentage of carbohydrate we can place between 5 and 7 per cent., because this is the percentage in which it exists in mother's milk, and in this percentage it is thoroughly assimilated without ill effects. This child would receive then 63 grams of carbohydrate, *i.e.,* 6 per cent. of 1,056 grams, the total quantity. We wish to find now what percentage of fat to feed the child. We determine now the number of calories supplied by the carbohydrate and proteid combined; 12 grams of proteid and 63 grams of carbohydrate equals 75 grams. Since each gram has a caloric value of 4.1, 75 grams will give 307 calories. But we need 500 calories, so the rest, 193 calories, must come from the fat. Since each gram of fat supplies 9.3 calories, 193 calories represents 20 grams of fat. We must have then 20 grams of fat in the whole mixture of 1,056 grams, which is 1.8 per cent. To restate the problem, an infant weighing 5 kilograms and receiving 1,056 grams of food in twenty-four hours, must have a formula 1.8 F., 6 CH., 1.13 P. in order to supply an energy quotient of 100, and a proteid quotient of 2.4.

I do not state that this is the formula for a child three months old; a formula will vary with the weight of the child and the total quantity of food. I have accepted Heubner's figures as to caloric requirements and Koplik's and Camerer's average weights of healthy infants; from these figures I have determined what infants of these weights should receive in percentages, presupposing a certain total quantity in twenty-four hours.

Age.	Weight in Grams.	Total Quantity in Grams.	Energy Quotient.	Proteïd Quotient.	F.	P.	CH.
2d week	3,400	465	65	1.2	1.7	.87	6
1 month	3,742	620	75	2.1	2.09	1.25	6
6 weeks	4,310	680	90	2.4	2.8	1.5	6
8 "	4,765	744	100	2.4	3.	1.5	6
10 "	5,215	992	100	2.4	2.4	1.25	6
3 months	5,670	1,056	100	2.4	2.5	1.3	6
4 "	6,237	1,178	100	2.4	2.75	1.27	6
5 "	6,687	1,200	100	2.4	2.8	1.3	6
6 "	7,145	1,250	90	2.7	2.9	1.37	6
7 "	7,485	1,302	90	2.7	2.8	1.54	6
8 "	7,710	1,395	90	2.7	2.8	1.52	5
9 "	7,860	1,488	90	2.7	2.8	1.5	5

From these formulæ we learn several facts about which there has been much unsatisfactory discussion. Firstly, the percentage of fat need never be above 3 per cent. This confirms the position Jacobi has held for many years and one to which most pediatricians are coming. Secondly, the percentage of proteid in these formulæ is higher than usually advised, especially in the early months. Most authors do not feed enough proteid in the early months, on account of the supposed difficulty in digestion. But from reported cases, and my own experience the fault seems to be not in the particular percentage of proteid, but in the excess of calories given in the whole mixture, mainly in the fats. Besides, if there is any difficulty in digesting the proteids of cow's milk it is not the whole proteids, but the caseinogen that may be at fault, and if we will feed lactalbumin instead we can easily give the requisite grams of proteid.

Fat, I think, is a more important and constant cause in the disturbances of nutrition and digestion in infancy. Fat can be a disturbing factor in several ways. Most frequently on account of its high caloric value, 9.3 calories per gram against 4.1 calories per gram of proteid and carbohydrate, it is the ingredient which gives rise to too high an energy quotient and symptoms of overfeeding. The fretfulness and slight rise of temperature often noticed in the latter half of infancy without any apparent cause therefor is due, I believe, to just this overfeeding. Often the excess of fat acts as an irritant to the gastric mucous membrane, and causes vomiting, or a peculiar fat constipation. At times it gives rise to a really serious disturbance of metabolism, an actual acidosis from the increase of fatty acids in the system. This train of symptoms can be avoided by reducing the total number of calories, and since these come largely from the fat, the total quantity of fat; merely reducing the percentage of fat will not have the desired effect. Here we have a clear demonstration of the importance of thinking in calories rather than in percentages. For it is possible to reduce the percentage of fat, and still, by increasing the total quantity of food, to raise the amount of fat actually fed, and the symptoms instead of disappearing would increase. If we further examine these formulæ, remembering that they represent the minimum amount of proteid and the maximum amount of fat to be fed, we notice that by feeding a little more proteid, which can be safely done, the formulæ approximate dilutions of whole milk. This seems a retrogression. But we must remember that the percentage method of feeding is based on the hypothesis of the indigestibility of proteids, and so this element was fed in very small amounts and fat in larger amounts so necessitating the use of the top milks in which the fat and proteids were in different proportions than in whole milk. But when we believe that most of the disturbances of nutrition are due to overfeeding, particularly of fat, we see again the logic in feeding dilutions of whole milk. But we are not bound to diluted whole milk as a method. There are cases where proteids are not tolerated except in minimum quantities and where we may want to give two or three times as much fat. Here we require certain top milks. By knowing the percentages of the different top milks, we can use the one which suits our formula best and not be compelled to adapt the formula to the top milk.

CONCLUSIONS.

(1) There is a minimum proteid requirement below which we should not feed infants.

(2) There is a maximum caloric requirement which we should not exceed.

(3) Enough fat is given to make up the necessary calories after the amount of proteids and carbohydrates are determined, and so will never be excessive. The percentage will rarely be above 3 per cent.

(4) Most disturbances of nutrition in the second half year are due to overfeeding and will be avoided by the caloric estimation.

(5) In determining how to modify cow's milk, we must be guided, in the first place, by the proteid and caloric requirements of the infant's metabolism. These vary with the weight and development of the infant, and so by this method we are compelled at all times to individualize in our milk modifications. The percentages of proteids and fat will vary with the quantity of food fed and merely are representations of the number of grams of each ingredient in the total mixture.

(6) To find out the minimum percentage of proteids we may feed an infant we need to know only the weight of the infant and the total quantity of food to be fed in twenty-four hours. The percentage of proteids will be found by dividing the total number of grams of proteids by the total quantity of food.

(7) To find the percentage of fat we may feed an infant we first determine the total caloric requirements of this particular infant, and substract from this the number of calories supplied by the proteid and carbohydrate. This gives the number of calories to be supplied by the fat. The calories so to be supplied divided by 9.3 gives the number of grams of fat that will be in the mixture, and this divided by the total quantity in grams will give the percentage.

(8) In this method it is found that top milks are rarely indicated.

(9) Any method which justifies the use of dilutions of whole milk is valuable because it is more adapted to home modification, and so accomplishes more good, in that it reaches a wider circle.

THE LEUKOCYTES IN PULMONARY DISEASES OF CHILDREN.

BY IRA S. WILE, M.S., M.D.,
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In general considerations of the symptomatology of the pulmonary diseases of children, slight attention has been given to the hematological conditions accompanying them. Text-books on pediatrics are deficient in information regarding blood examinations as an aid in diagnosis and prognosis. As an evidence of the aid in diagnosis and prognosis to be derived from examinations of the blood, a brief survey of the leukocytes in pulmonary diseases of children is most instructive.

Though acute and chronic infections are characterized by varying degrees of anemia, the leukocytes are the dominating diagnostic factors of the blood examination. Until a few years ago, the main question asked was: Are the leukocytes increased; is a leukocytosis present?

The more important query today is, In what way do the leukocytes vary; does any variation in the types of leukocytes occur? The total leukocyte count is not the paramount fact in pulmonary diseases when blood examinations are being interpreted.

In order to appreciate the pathological variations occurring in childhood, it is essential to bear in mind the normal percentages of the different types of leukocytes and their total number at various ages.

The average total leukocyte count of the first day of life varies from 36,000 (Japha) to 17,100 (Perlen). According to Japha the leukocytes vary between 12,000 and 13,000 during infancy. Perlen's normal cases averaged as follows:—

3	weeks to	4	weeks,	11,700
10	" "	18	months,	10,900
2	years to	4	years,	10,000
5	" "	7	"	9,400
8	" "	16	"	8,500

Karnizki places the figures as follows:—

Under 1 year,	12,628
1 year to 6 years,	9,415
6 years " 15 "	7,900

In round numbers my averages of total number of leukocytes is as follows:—

During	1st year,	12,000
"	2d "	10,000
"	3d "	9,000
After	4th "	8,000

The estimation of the normal differential leukocyte count is of greater importance. Japha places the lymphocytes at from 50 per cent. to 55 per cent. during infancy, and states that they gradually decrease after the second year. He found that the lymphocytes predominate from the third to the sixth year.

Karnizki's figures are very carefully worked out.

	Polynuclear Neutrophiles.	Lymphocytes.
During infancy	29.3 per cent.	57.8 per cent.
1st year to 4th year..	35.4 " "	54.4 " "
At 8th year	46.6 " "	43.6 " "
After 8th year	52.55 " "	30.34 " "

The following table, arranged in even percentages for convenience, represents my personal findings. It is to be noted that the various types of lymphocytes are grouped together. The important feature in the differential count lies in a contrast of the relative percentages of the lymphocytes and the polynuclear neutrophiles:—

Age.	Polynuclear Neutrophiles.	Lymphocytes.
Up to 1 year	30 per cent.	56 per cent.
1 year to 2 years	35 " "	53 " "
2 years " 3 "	38 " "	51 " "
3 " " 4 "	42 " "	47 " "
4 " " 5 "	47 " "	41 " "
5 " " 6 "	52 " "	39 " "
6 " " 7 "	52 " "	37 " "
7 " " 8 "	53 " "	35 " "
8 " " 9 "	54 " "	33 " "
9 " "10 "	55 " "	31 " "
Over 10 years	60 " "	30 " "

In determining the total leukocyte count a word of caution is advisable. The physiological digestive leukocytosis should not be forgotten. This leukocytosis occurs from one-half hour to two hours after the ingestion of food. The digestive leukocytosis is uncommon in breast-fed infants, inconstant in bottle-fed infants and far from constant during early childhood. The height of the digestive leukocytosis is by no means an index of health. The well-nourished and well-developed children more frequently show a marked digestive leukocytosis, at times reaching 10,000. The nature of the food ingested, however, is as important as the health of the child. Proteid food induces the most pronounced leukocytosis.

Another factor in considering the total leukocyte count is the recognition of its negative value. As Head has stated: "From one and 2 years the chief value of the procedure, *i.e.*, estimating leukocytes, must be to assist in the identification of such diseases as are characterized by a diminution rather than an increase of the leukocytes in the circulating blood." Typhoid fever and grippe, both of which may present masking pulmonary symptoms, are usually accompanied by a leukopenia, provided no complication exists.

The relation between the total leukocyte count and the relative proportion of polynuclear neutrophiles is not as reliable for diagnostic purposes, owing to the tendency of the blood of children to revert to the infantile or lymphocytic type. For the same reason the surgical rule that the total leukocyte count is an index of the bodily resistance or reaction to infection, while the percentage of the polynuclear neutrophiles serves as an index of the intensity of infection, appears to have many exceptions in the diseases of children as compared with the same diseases in adult life. In the greater proportion of cases, however, the rule suffices for general interpretation of leukocyte examinations.

Heiman, in stating that "in general it may be said that the diagnostic value of the leukocytosis in the pulmonary diseases of children is limited," had not had an opportunity to grasp the diagnostic significance of the relative leukocytosis, and placed too much stress on the total leukocyte count.

At the present writing the most valuable single blood examination for diagnostic purposes is the differential leukocyte count, to determine the existent type of relative leukocytosis. In pulmonary diseases of children the value of determining the relative leukocytosis is well illustrated.

According to the leukocytic formulæ, pulmonary diseases of children may be classified into four types:—

(1) Leukocytes primarily normal and relatively unchanged.
(2) Lymphocytosis present.
(3) Eosinophilia present.
(4) Polynuclear neutrophilic leukocytosis present.

By way of illustration I offer in parallel some self-explanatory figures based upon differential leukocyte counts made at Vanderbilt Clinic in the children's department. The children were all under fourteen years of age.

Number of cases	10	6	16
Disease	Early Pul. Tuberculosis.	Advanced Pul. Tuberculosis.	Bronchitis.
1. Lymphocytes	39.5	20.3	34.1
2. Polynuclear neutrophiles .	55.5	*79.1*	*64.5*
3. Polynuclear eosinophiles .	4.5	.5	1.3
4. Polynuclear basophiles ...	.4	.2	.6

Number of cases	25	12	14	9
Disease	Pertussis.	Asthma.	Pneumonia.	Empyema.
1. Lymphocytes	*64.1*	35.7	22.1	23.
2. Polynuclear neutrophiles	33.4	52.6	*75.8*	*73.3*
3. Polynuclear eosinophiles	2.5	*10.7*	.68	1.9
4. Polynuclear basophiles	.3	.7	.1	.7

Italics indicate the diagnostic leukocytosis.

It is my desire merely to briefly characterize the differential leukocytic formulæ of the various pulmonary diseases of children.

Tuberculosis of the lungs causes practically no alteration of the leukocyte picture unless secondary infection occurs. When pulmonary tuberculosis develops in a poorly nourished rachitic or syphilitic child there is an apparent lymphocytosis, which, however, is due to the nutritive factors and not to the active tuberculous process. When secondary infection takes place, there is an increase of the polynuclear neutrophilic leukocytes. As the infection increases in extent, the eosinophiles decrease in number. The total leukocytosis that develops arises from the increase of the polynuclear neutrophiles. An improvement of the general condition is attended by an increase of the eosinophiles and by a decrease of the polynuclear neutrophiles, providing they were previously increased. The decrease of the percentage of eosinophiles I regard as indicative of an advance of the tuberculous toxemia and therefore of poor prognosis. There may be an increase of the basophiles, and this increase appears to me to bear some relation to the general improvement of the child. The basophilia usually varies somewhat parallel to the eosinophilia. In advanced cases, however, the eosinophiles decrease more rapidly than do the basophiles. A decrease of eosinophiles and basophiles is a point of especially bad prognosis.

Pertussis affords an excellent example of lymphocytosis. In the catarrhal stage of pertussis, there is an increase of the total number of leukocytes even before the leukocytic formula begins to change. The total leukocytosis is roughly parallel to the intensity of the disease. The leukocytes may reach 50,000. The leukocytosis is most pronounced in very young children, and may reach a greater height than in any disease unattended by fever.

The leukocytosis continues throughout the paroxysmal stage, during which period it reaches its height. As the paroxysmal stage declines, the leukocytes gradually fall to normal. The entire period necessary to return to normal varies according to the intensity and persistency of the disease.

The characteristic lymphocytosis begins at the onset of the catarrhal stage, long before any "whoop" is heard; in fact, before the cough appears as a disturbing factor. The lymphocytes increase, especially the small lymphocytes, until their highest percentage is reached during the paroxysmal period. Their decrease to normal may cover many months.

Occasionally the eosinophiles, which are never lacking, appear to rise much above normal during convalescence. This increase is very inconstant. The increase of the eosinophiles during the paroxysmal stage indicates the beginning of the decline of the disease.

Eosinophilia is a most constant and characteristic feature of emphysema. When bronchial asthma ensues, the eosinophiles rise to high percentages: 28 per cent. was the highest in my series, but 54 per cent. of eosinophiles has been observed in asthma. During the period free from asthma the eosinophilia persists, though in lower percentages than during the attacks. Asthma due to cardiac or renal disease is unattended by eosinophilia.

The pulmonary diseases attended by a polynuclear neutrophilic leukocytosis include bronchitis, pleurisy, pneumonia, empyema. Bronchitis of the acute type, involving only the large tubes, causes no leukocytosis and very little alteration of the normal percentage of the neutrophiles. As the bronchitis involves the smaller tubes, as is particularly common in children, a moderate leukocytosis ensues. The neutrophiles are moderately increased, while the eosinophiles may decrease. The finer the tubules affected, the greater is the increase of the neutrophiles. Chronic bronchitis presents practically no alteration of the leukocytes.

Pleurisy presents a leukocytosis averaging about 20,000. The leukocytosis is of the neutrophilic type. If the serous pleurisy becomes purulent and empyema develops, the neutrophiles increase to high percentages, averaging in my series 73 per cent. If the empyema becomes sacculated or the differential count is made after the empyema has been long existent, there may be little variation of the leukocytes owing to the decreased toxic absorption.

The absence of polynuclear neutrophilic leukocytosis is opposed to the existence of pleurisy or pneumonia unless an uncomplicated tuberculous infection is the etiological factor or the leukocytosis has reverted to the infantile or lymphocytic type, as may occur rarely.

Pneumonia, whether bronchopneumonia or lobarpneumonia induces a leukocytosis of the neutrophilic type. Rarely a lymphocytosis occurs. The total leukocytosis bears no relation to the amount of lung tissue involved by the pneumococcic process. The total leukocyte count averages about 30,000. The neutrophiles average about 75 per cent. They may form 95 per cent. of the leukocytes. In lobarpneumonia the total leukocyte count falls just previous to or at the crisis. At the same time the neutrophiles begin to decrease. If the neutrophiles persist in remaining high after the crisis, delayed resolution, empyema, gangrene, or some other complication is present.

During the attack of pneumonia the eosinophiles disappear. With the reappearance of the eosinophiles convalescence is about to begin. Cardiac failure cannot be foretold by any leukocytic picture. In bronchopneumonia the leukocytes and the neutrophilic percentages decrease gradually unless a complication arises.

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CLINICAL MEMORANDA.

ABSCESS OF THE LUNG DUE TO WIRE NAIL TWO INCHES LONG IN RIGHT BRONCHUS.—OPERATION.—RECOVERY.*

BY FRANCIS HUBER, M.D.
New York.

WITH SURGICAL COMMENTS BY DR. HENRY M. SILVER.

In the *Philadelphia Medical Journal*, May 3, 1902, the writer presented "A Case of Foreign Body in the Lung—Diagnosis Confirmed by Radiography." The case unfortunately terminated unfavorably. In the present instance the results were favorable, and as many points of interest were present it is considered desirable to place the details on record.

Isie B., two and one-half years old. Was admitted to the Children's Ward in Beth-Israel Hospital, September 21, 1906.

History of summer complaint during the entire summer of the preceding year. Six months ago had measles, followed by pneumonia, ill about six weeks. Four weeks ago had a second attack of pneumonia, from which he recovered in about a week's time. As to further points bearing upon his condition, it is claimed that he has not been well for the past six months. Was supposed to have had whooping cough months ago, coughed considerably, expectoration mucopurulent. At no time was any blood brought up. Occasionally he would vomit after a coughing spell. More or less temperature had been reported. Has lost flesh, appetite is capricious, sweats profusely at times. Dyspnea present and cyanosis is quite marked.

Since admission the most prominent symptoms have been a paroxysmal cough, particularly marked when he becomes excited or lies on the healthy side. Vomiting occurs now and then, generally after coughing spells. The temperature has been of a septic type, ranging between 99°F. and 103°F., attended by irregular sweating and prostration. Loss of flesh and strength has continued. The dyspnea is pronounced and cyanosis of mucous membrane exists. Sputum (negative for tubercle bacilli) was distinctly purulent with excess of polynuclear cells. Prior to admission to the hospital several exploratory punctures had been made by the physician in charge with unsatisfactory results—the diagnosis resting between an encysted or interlobar empyemia and abscess of the lung.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 26, 1908.

Examination of nose and mastoid negative. Teeth and gums in good condition. Tongue dry and slightly coated. Throat negative. Conjunctivæ negative, no glands enlarged at angle of jaw. Pupils react to light and accommodation.

Physical Examination.—Chest fairly well formed. Expansion limited on the right side. Heart not displaced. Anteriorly, marked dullness over upper lobe of the lung on the right side, increased fremitus above, bronchial voice and breathing approaching the cavernous type. Posteriorly above, decided dullness and bronchial breathing. Over rest of right lung are found diminished breathing, voice and fremitus, with dull percussion note. Left lung not involved.

DIAGNOSIS.—Abscess of lung involving upper and middle lobe.

October 2d. Radiograph taken, but interpretation was not satisfactory.

October 6th. Exploring syringe introduced posteriorly in seventh inter-space, revealed a few drops of pus.

October 7th. Resection of rib (8). Lung was explored in various directions, but we failed to locate the abscess.* Gauze drain introduced and usual dressing applied.

Progress, as far as wound is concerned, satisfactory. On this day, October 26th, the physical signs simulated extensive consolidation of upper and middle lobe, due to occlusion of the opening. In a few days, as the abscess gradually emptied, the usual signs of a cavity reappeared.

November 14th. Fluoroscopic examination revealed wire nail in trachea and right bronchus, beautifully shown on plate.

When the mother was closely questioned, she now remembered that eight months ago the little one, while playing with some nails, suddenly had a distinct and characteristic suffocative spell, which soon passed over. The subsequent symptoms have been detailed above.

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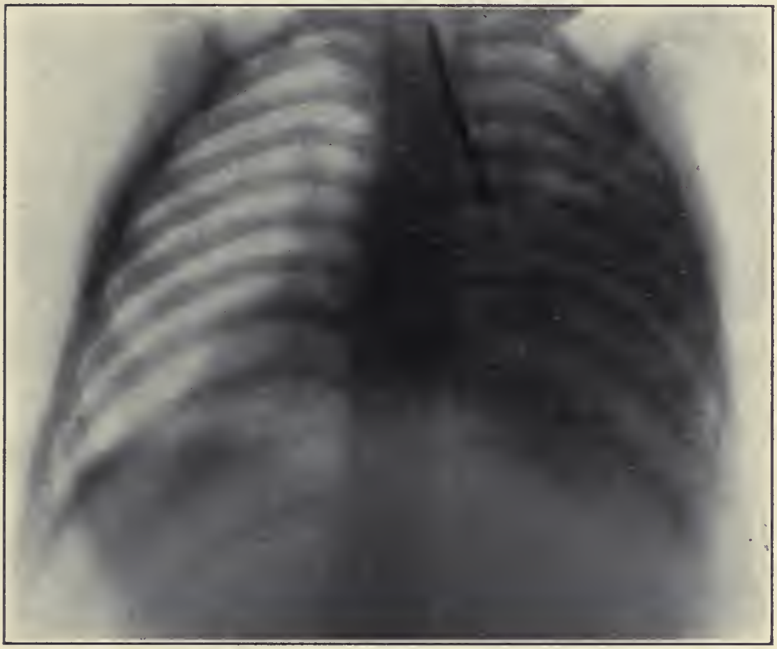
* Exploratory puncture has been considered the crucial test, although authors differ widely as to its value and significance as a negative manifestation. Such was J. B. Murphy's teaching in 1898. Tuffier says exploratory puncture is permissible but often deceptive, and when negative the puncture is to be made many times. He has made two to twelve punctures in each case and yet failed to locate the cavity in 17 per cent. of the cases of gangrene, 17 per cent. of the abscesses and 33 per cent. of the bronchiectasis. He claims that the procedure is harmless when done at the time of operation. Foul gas in the syringe is just as positive as pus. A radiograph may materially aid us in locating the purulent process.

November 20th. Low tracheotomy and removal of nail by the writer. (Description by Dr. H. M. Silver.*)

From the time the trachea was opened the pus and escaping air had a decided fetid odor. Tube removed November 23d.

November 28th. Wound smaller and healing satisfactorily. Over right upper lobe anteriorly breathing of a cavernous type with many large and small moist râles. General condition greatly improved. Temperature coming down to normal.



X-ray plate showing foreign body and condition of lung.

December 6th. Wound healed. Child is still troubled with paroxysmal cough, particularly when disturbed.

January 26, 1907. For the past seven days the temperature has been irregular, ranging from 98° to 103°, probably due to a mild infection from the pulmonary abscess.

February 20, 1907. Temperature had been normal for several weeks. To-day it rose to 101°F.; pulse, 128; respiration, 30. Following day temperature, 103°F. About this time a small abscess appeared at the site of the thoracotomy done October 7th. This was incised the following day and a small amount of pus escaped, revealing a small sinus leading to the pleura. Two ribs were resected to allow the chest wall to fall in and thus favor contraction of the pulmonary abscess.

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* I would herewith gratefully acknowledge my obligations to my colleague for his valuable assistance and suggestions.

March 17th. For the past three weeks temperature varied between normal and 103°F. Wound in chest wall gradually closing. General condition very much improved. Physical signs over upper portion of right lung anteriorly and posteriorly reveal large and small moist râles. Breathing diminished posteriorly, anteriorly somewhat bronchial in type.

June 9th. Progress favorable since last note. Sent to Willard Parker Hospital on account of severe nasal diphtheria and laryngeal symptoms.

July 1st. Returned to hospital in good condition. Temperature, 98°F.; pulse, 120; respiration, 30. Wound in chest wall discharging a little. Pulmonary signs about the same.

September 9th. For the past two months temperature normal, child doing nicely. Small sinus remains. To-day the temperature rose to 105°F., due to a slight involvement of left lung, which ran a favorable course in about five days.

September 17th. A small piece of bone discharged from wound.

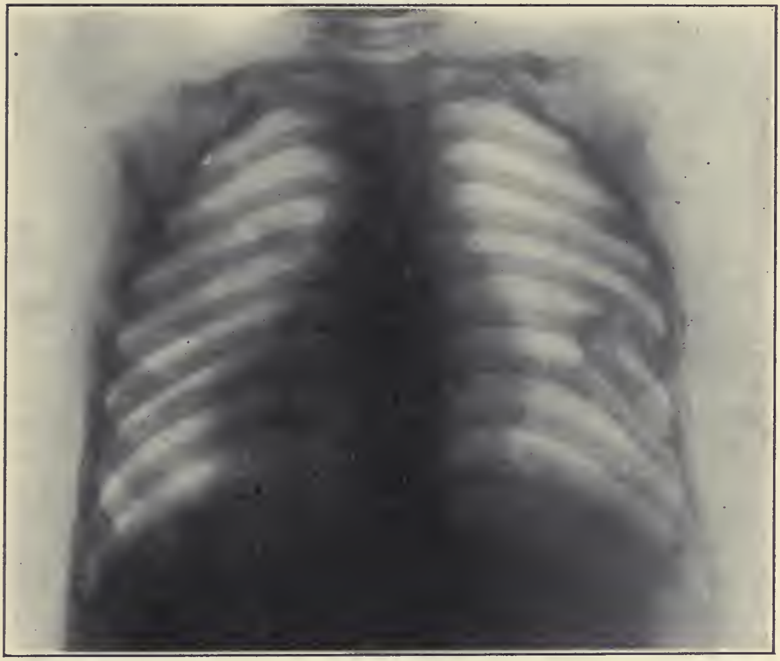
September 29th. Wound entirely closed.

December 2, 1907. Since September 16th the temperature has been normal; great improvement in general health. Physical signs those of fibrosis of upper and middle lobe with dilated bronchi. The secondary result of the obstructed circulation is shown in the clubbing of the fingers and toes, with moderate cyanosis of the mucous membrane.

With a definite history and typical symptoms, little difficulty is met with in arriving at a diagnosis of a foreign body in the bronchi. The case is different when no such history is obtainable. In recent years the X-Ray has afforded valuable assistance, not only in establishing the presence, but also the location, of the body, provided it casts a shadow. The bronchoscope is the most recent addition to the appliances for examining the larynx, trachea and bronchi. With its aid the operator, in a large number of instances, is in a position to locate and remove the object accidentally inhaled.

In this part of the paper the principal and main features of interest center in the diagnosis. The history of a foreign body having been inhaled, was not developed until later on, the physical signs pointing to a more or less diffuse process in the upper and middle lobe of the right lung.

In general, in this class of cases, we are told that the child had been ailing for a longer or shorter period; the temperature is usually irregular in type, more or less dyspnea is present and cyanosis may or may not be found. Septic manifestations, as pallor, sweating, loss of appetite, diarrhea and emaciation are noted. Cough is common.



X-ray photo taken about March 16, 1908, by Dr. I. S. Hirsch, shows distinctly the characteristics of the chest walls from which several ribs were resected, and the changes in the lung. Compare with first radiograph.

A very characteristic symptom, one which should arouse our suspicions at once, is ordinarily not interpreted correctly. I refer to the paroxysmal cough, during which the child grows red in the face and frequently vomits. The act is very distressing and is attended with a good deal of exhaustion. The spells are repeated at irregular periods, the child being comfortable in the interval. The attacks are more apt to occur during crying or excitement, and generally recur with greater frequency when the patient is placed on the healthy side. "The position assumed by the patient may effect the symptoms, especially if the body be movable. Naturally the position is assumed in which the foreign body is least disturbed." (*Modern Medicine,* Vol III., page 708.)

The severe coughing spells shift the body from place to place and even cause it to enter the other lung. This has occurred with a heavy object, such as a bullet. The paroxysms simulate whooping-cough very closely, now and then even the inspiratory whoop is observed.

The expectoration may be purulent, now and then it is streaked with blood. In a case under the writer's observation, the recurring hemorrhages ceased only when an iron nail was coughed out several years later. In some cases there is the characteristic odor of gangrene. The odor may be a prominent feature or may be noticed only during the paroxysmal coughing spell. Now and then, if our suspicion is aroused, a very careful inquiry regarding the onset of the illness may elicit the story of a sudden choking spell, attended by cyanosis, the patient appearing to be in imminent danger of suffocation. Such an attack may have been but of a few seconds duration or may have lasted for several minutes, but from this time on the "whooping-cough-like attacks" develop at irregular intervals. To bring out this point clearly and forcibly the following quotation taken from Carr's *Practice of Pediatrics* (page 681) is appended. "In some cases the presence of a foreign body is quite unsuspected, the child being brought some years after the accident on account of the expectoration of foul pus. On examination a unilateral fibroid lung with bronchiectasis is found, and by questioning the parents a history of whooping-cough at the onset may be elicited. This seems to agree well with the etiology of a simple fibrosis of the lung, and it may well be overlooked that the so-called 'whooping-cough' represented in reality the spasmodic attacks set up by the foreign body before it became impacted."

A. McPhedran writes: "The most difficult cases are those in which there is no history of the entrance of a foreign body. These cases often present the most anomalous symptoms. In all cases, especially children, with such unusual symptoms, more than half the difficulty may be overcome by bearing in mind the possibility of a foreign body. This cause should be present to the mind in all cases showing signs of local septic pneumonia, or gangrene of the lung, or of general pyemia with signs of early involvement of the lungs." (Osler's *Modern Medicine,* Vol. III., page 708.)

The prominent symptoms, then, are dyspnea, paroxysmal cough, septic temperature and possibly the expectoration of pus, or blood, or a fetid odor to the breath, particularly during the cough. Such a symptom complex points to a septic bronchopneumonia, localized abscess with or without gangrene, and, in the absence of other well-recognized causes, suggests a foreign body. To establish a positive diagnosis, an X-Ray examination must be resorted to. The method, however, is only of value when the object casts a shadow.

The physical examination reveals dullness, or even flatness, absence of respiratory murmur with diminution or loss of vocal fremitus and more or less restricted movement of the affected side. The signs are apt to vary in different cases and at different times in the same patient.

They will vary with the size and location of the pulmonary area involved, and the presence and absence of bronchial patency or communication. When a bronchus is occluded or the cavity is temporarily filled, the percussion will give a dull or flat note.

If, on the other hand, there is a direct opening, we may succeed in getting a cracked pot sound. Upon auscultation the sound will vary, depending upon the presence or absence of bronchial communication. In the former case, we may have bronchial, cavernous or amphoric breathing.

In general terms, in the overlooked cases, we have the usual evidences of a localized abscess with or without gangrene or the signs of a more or less complete consolidation of one or more lobes on the affected side, and, finally, if the infection is less virulent a chronic inflammation resulting in interstitial changes and possibly bronchiectasis, especially in cases in which there is only partial occlusion of the bronchus.

The diagnosis of abscess, with or without gangrene, or of a septic bronchopneumonia, etc., having been established, we must go a step further and look for the primary etiological factor. In the differential diagnosis the following pathological conditions must be considered: Localized empyema, an empyema discharging into a bronchus, interlobar empyema, pulmonary tuberculosis with rapid caseation, embolic processes from an old heart lesion, or secondary to a septic process in a distal vein, or chronic suppurating bone disease in the jaw, ear, etc., bronchiectasis, cysts (echinococcus or dermoid), and pneumonic changes due to pressure upon bronchi by enlarged glands, etc.

A careful consideration of the symptoms and progress of the case, with microscopic examination of the sputum and the use of the X-Ray, will materially assist in arriving at a correct diagnosis.

The diagnosis of pulmonary abscess having been established, the question of treatment arises, whether expectant and palliative or surgical. It is, of course, understood that the general condition must be improved by good food, fresh air and tonics. In view of the danger of tuberculous infection, the patient should be given guaiacol in regular and appropriate doses.

The surgical treatment will depend upon the size and location of the abscess and, furthermore, upon the presence or absence of pleural adhesions.

"Should there be an absence of adhesion and the lung collapse when the pleura is opened, and if the abscess communicates with a bronchus, it would seem from a theoretical standpoint that it should drain or close. Thoractomy in this manner is so easily performed that it appears to me applicable in the class of cases in which pneumotomy is most dangerous, *i.e.*, where there is an absence of adhesions. It allows of (1) drainage through the bronchus; (2) contraction of the cicatricial abscess wall; (3) peripneumonic compression from the air in the pleural cavity. All of these should favor the repair of the abscess." (J. B. Murphy's *Surgery of the Lung*, page 64.)

According to Tuffier 11 per cent. of abscesses of the lung are caused by foreign bodies. Now in the operative treatment of chronic purulent processes in the lung by pneumotomy, healing is slow and there is a possibility of a prolonged or permanent fistula remaining. In view of this danger the following suggestion of J. B. Murphy might be favorably considered.

"Abscesses without adhesions and with bronchial communications should not be treated by incision and drainage through the chest wall, but by producing collapse of the lung by injecting nitrogen gas or a liquid into the pleural cavity, thus compressing the lung and allowing the connective tissue in the wall of the abscess to contract and obliterate the cavity with the aid of the bronchial drain."

As the abscesses due to foreign bodies usually communicate with a bronchus, the discussion of the treatment of other varieties is foreign to our subject.

Expectant Treatment.—In reviewing the literature, numerous cases are reported in which a successful result followed the waiting plan. The risks, however, are great, not only from the inherent danger due to the presence of the object, but from the secondary and later changes in the organ itself, with the subsequent possible development of tuberculosis.

NOTE.—Patient seen in October, 1908; general condition excellent, although fibrosis of lung still persists.

PART II.

SURGICAL COMMENTS.

BY HENRY MANN SILVER, M.D.,
New York.
Surgeon to Gouverneur and Beth Israel Hospitals; Consulting Surgeon to the New York Infirmary for Women and Children.

Since Professor Killian, of Freiberg, read his paper on bronchoscopy before the British Medical Association in 1902, the method of treating foreign bodies in the air passages has been completely changed. No longer are children turned upside down, slapped on the back to dislodge the foreign body, some cases even dying from spasm of the glottis during the procedure when surgical aid was not at hand. When the inversion method was not successful, the trachea was opened, tickled with feathers, or forceps, wires or hooks were introduced blindly in hopes to dislodge or extract the foreign body.

In order to make the diagnosis complete and the operation for removing the foreign body as simple as possible, every case should be examined with the fluoroscope as soon as possible, and a plate exposed. Do not depend too much on a negative fluoroscopic report—it is dangerously unreliable. Do not depend too much on a negative plate report, as cases are on record of pins in the bronchi showing no shadow until the fourth plate was made, others with two plates, as in our own case. Some non-metallic bodies do not cast a shadow, but they will cause a circumscribed shadow of inflamed tissue after they have been in a bronchus for some time. The advantages of an X-ray plate are the showing of the nature and position of the foreign body, thus enabling the surgeon to select a bronchoscope of the proper length. These advantages were very clearly demonstrated on the plate of our own case.

An operation for removal having been decided on, the little patient was placed on a table with a small pillow under his shoulder to make the neck more prominent, and chloroform very carefully administered. Dr. Huber made an incision an inch and a half long in the median line of the neck beginning at the upper margin of the sternum, dividing skin and superficial fascia; some superficial veins were clamped, divided and ligated, the deep fascia cut through on a director, the sterno-thyroid muscles separated and the trachea exposed. As the thymus gland appeared in the lower angle of the wound it was pushed down behind the sternum and held in place with a catgut suture. A needle armed with fine linen thread was carried through the trachea on each side of the median line and looped. Slight traction on the loops brought the trachea forward, which was then fixed above by a double tenaculum and three rings divided. When the trachea was opened large quantities of bloody pus escaped. When this was wiped away an endoscopic tube in the shape of a Burrage urethral and cervical speculum, 7 mm. in diameter, was introduced after the child had been placed in Rose's position. The endoscope was wiped out and a small electric light introduced. It was difficult to obtain a clear view of the bronchus on account of the pus welling up into the tube, but a dark spot surrounded with pus could be seen; this was grasped with a Noyes alligator forceps. When traction was made a sense of pressure was conveyed to the endoscope, which was withdrawn with the forceps. The foreign body, a wire nail two inches long, head downward, covered with black pus, was found to be in the grasp of the forceps. After the withdrawal of the nail, violent coughing spells caused more pus to be thrown out of the opening in the trachea. When the coughing became less violent a tracheal tube was introduced and the external wound diminished by one suture of silkworm gut below and two above the tube. The tube was removed in forty-eight hours and the patient's convalescence was uneventful. During the administration of the chloroform before the operation, it was noticed that the character of the respirations changed—they became labored—coarse tracheal râles were heard and the face was cyanosed. The anesthetic was immediately stopped and the head thrown forward; this diminished the cyanosis and difficulty of breathing, but did not remove the tracheal râles. A pulmonary abscess, ruptured early in the course of the anesthesia, without doubt, caused the above distressing symptoms, as was shown by the escape of a large quantity of pus when the trachea was opened. The experience gained from this case emphasizes the following:—

First.—Have everything ready before the anesthesia is started in order to be prepared to meet any emergency that may arise. This includes the presence of plenty of assistants and nurses.

Second.—Use chloroform as the anesthetic, as but a small quantity is required, and it does not cause a large flow of mucus. The chloroform should be administered with the greatest care by one skilled in its use, and it is well not to extend the head until the operation is about to begin, if the foreign body has been in the bronchus for any length of time. Jackson considers the "preliminary use of morphine, with its prolonged abolition of the cough reflex unsafe. The cough reflex is the watch-guard of the lungs, by which infective or deleterious materials are removed. The preliminary use of atropine to lessen secretion, as suggested by Ingals, is a good, safe procedure. It has the additional advantage of protecting the circulation from shock."

Third.—In addition to the ordinary instruments used to open the trachea, special instruments will be needed. The experience derived from our case leads me to put some form of an aspirating apparatus first on the list, for had it not been for the discovery of a dark spot in the pus, which proved to be the foreign body, it would have been very difficult with the means we had at hand to have removed such large quantities of pus from the trachea and bronchus sufficiently to have found the foreign body. Specialists and large hospitals can afford to have an apparatus operated with an electric pump. But a Dieulafoy or Tiemann's aspirator with suitable attachments, with an assistant to control the valves, or even a bulb-syringe can be used for this purpose. Cotton on holders can be used to remove small quantities of blood or mucus, or to apply adrenalin solution, 1-1000 if needed. Next, some form of bronchoscope will be needed, the use of the Burrage urethral and cervical speculum, together with the small electric light in our case, was perfectly satisfactory, because the foreign body was high up in the bronchus. In case of emergency, almost any endoscopic tube with a diameter of from 7 to 10 mm. can be used through an opening in the trachea. It is better, if possible, both in upper as well as in lower tracheobronchoscopy, to use Chevalier Jackson's modification of Killian's bronchoscope. The advantages of the Jackson instrument are illumination by a small cold lamp carried down to the extremity by a light carrier, thus doing away with the constant readjustment of a head lamp. The light being in the tube is always illuminating the object, regardless of the movements of the patient or operator. A small bubble or mass of secretion, or an instrument introduced into the tube, does not cut off any light, as the light is beyond. The tubes are also fitted with an auxiliary drainage canal, which maintains a dry, clean condition at the distal end of the tube. Both the lamp and drainage canal can be easily removed for cleansing. The operator should always take the precaution to have extra lamps on hand. The tubes should be perforated on the sides at lower end. When the foreign body is located, how can it best be removed? In our case the foreign body was easily removed with a Noyes alligator forceps. If it is situated low down in a bronchus, Coolidge's or Jackson's forceps are very useful. If it is an open safety pin, Mosher's or Jackson's safety pin closer can be used with advantage.

Fourth.—In young children giving a history of a foreign body lodged in the lower air passages for some time, it is much easier, in fact safer, to pass the bronchoscope through a low tracheotomy wound. The opening in the trachea does not complicate or add to the danger of the operation.

TREATMENT OF DIPHTHERIA.—Despite the fact that large doses of antitoxin have been used, G. König (*Therap. d. Gegenwart,* July, 1908) occasionally encounters cases of faucial diphtheria in which an improvement is not evident. In such cases he advises that the injections be continued and that the affected parts should be carefully examined with the finger. Where there is a marked hardness of the infiltration, the parts should be freely incised. As long as the vascular exits are free, the antibodies introduced with the serum will readily reach the diseased parts, but where the channels are occluded, the toxins will continue to destroy tissue, no matter how much antitoxin circulates in the blood. The antitoxin should always be given as early in the disease as possible.—*Merck's Archives.*

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PYELITIS TERMINATING IN SUPPURATIVE NEPHRITIS—CASE AND SPECIMENS.*

BY J. PARK WEST, M.D.,
Bellaire, O.

The child from whom these kidneys were taken was a female ten months old when taken sick; her death occurred twenty-four days later. She had always been a healthy child, and had just been weaned on account of the mother's health. Her illness can be divided pretty definitely into three periods: the first represented by a lobar pneumonia, the second by pyelitis and the third by pyelonephritis.

I saw the child two days after the beginning of her sickness. A croupous pneumonia was suspected, but, owing to the late appearance of the physical signs, a positive diagnosis was not made until twenty-four hours before the crisis, which took place early in the morning of the sixth day of her sickness.

The second period of about ten days began on the evening of the day of the crisis by the temperature going up to 103° F., without symptoms on the part of any other organs. It is believed the pyelitis began at this time and was a direct result of the pneumonia. There was not now, nor had there been, any evidence of vulvovaginitis; it was only during the last period that a vulvovaginitis developed. While during the pneumonia the urine had been quite free, of a strong odor and stained the napkin deeply, it was now not so free, had but little odor and caused but little staining. On this first day of the second period, after three days' trial, a sample of one teaspoonful of highly acid albuminous urine was secured; it also contained a number of small cells and a few epithelial cells. The urine the next day was the color of milk and water, and for the next eight days was of a clean milky color. It was acid for the first few days; then became neutral, being slightly alkaline twice. The sp. gr. of but three specimens could be taken—it was 1014, 1012 and 1014. It always contained pus, albumen, pus cells in abundance, a great many epithelial cells of different kinds, and not a few blood cells. Altogether, about a half-dozen hyalin casts were seen. At times, the secretion was fairly free—at others scanty. On the second day of this period the temperature was 104⅖° and 104°, after which it went down gradually, until the eighth day it had almost subsided. There were never any marked excursions of the temperature, nor any chills or sweats.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 25, 1908.

For three days there was marked soreness over the entire body, and at all times there appeared to be soreness over the left kidney only. After the third day there was swelling of the face, hands and feet, which later extended up the arms and to the thighs, and pitted over the tibia. The child was very pale and depressed, but not wasted. At times she was very restless and at others took prolonged sleeps, and was usually dazed for some time after waking. During the first period she had vomited three or four times and the bowels were rather constipated; there was no vomiting during the second period, but on two or three days the bowels were loose. The urine gradually increased in amount and was usually passed more frequently, but was seldom free, and while the amount of albumen and pus diminished, they were never absent, and the milky color persisted. For three days now (thirteenth to fifteenth days) the general condition improved slightly and the temperature ranged from 99.4° to 100.2° F.

On the sixteenth day of her sickness, after three days of slight and gradual improvement, the third period began suddenly with severe gastrointestinal and uremic symptoms and continued until her death, eight days later. During this period there was never any fever and once the temperature was 98° F. per rectum. The vomiting was very severe and from twelve to twenty-four times in the twenty-four hours, while in the same time there were from four to twelve stools. Soon after the oncoming of these symptoms a vulvovaginitis developed. The urine was lessened again, although frequent small quantities were passed, excepting on two days (eighteenth and twentieth) it was fairly free. There was none passed for thirty hours before her death and about a half ounce was found in the bladder at the post mortem. The urine remained milky, but did not look so clean. There was less pus and a little more albumen. The cells—pus, blood and epithelial—were more numerous. An occasional hyalin and epithelial cast was seen, but infrequently. A sufficient quantity to get the sp. gr. was not secured. Every specimen tested for reaction was neutral. Most of these last eight days she was never fully conscious, and for two days (Wednesday and Thursday, or twentieth and twenty-first) she was semicomatose. On the third to the fifth days the right kidney could be easily felt through the anterior abdominal wall; after the fifth day it could no longer be felt. For the last three or four days she suffered so greatly that considerable doses of codeine had to be given her to control the screaming and restlessness.

The postmortem was limited to the abdomen. The pelvis of each kidney was thick and rough, and on the surface of each were a few small spots of distended capillaries. The left kidney weighed 80 grams and the right 72. This should be contrasted with 30.1 grams, the average weight for children of this age, as given by Bovaird and Nicoll in their tables in "The Weights of the Viscera in Infancy and Childhood" (Archives of Pediatrics, September, 1906). Vierordt's table (quoted in the same paper) gives practically the same weight.

Dr. W. G. MacCallum, who kindly made the microscopical examination, sends the following report: "The section of the child's kidney shows a remarkable suppurative nephritis. The capsule is unaffected. The blood vessels are in general normal in appearance, although the smaller ones are distended with blood and there are occasional hemorrhages.

"Scattered through the tissues, sometimes in connection with disintegrated tubules, sometimes inside the tubules, there are clumps of bacteria. These do not appear to be in the blood vessels at all. They are bacilli somewhat larger than the typhoid bacillus. The tubules are very generally distended, with great quantities of leukocytes and desquamated cells. There are no definite abscesses, but relatively few of the tubules escape. The glomeruli wherever seen seem fairly well preserved. The remaining tubules show a most extreme fatty degeneration of the epithelium. The tubules of the medulla are uniformly filled with the débris of cells and leukocytes.

"The absence of glomerular changes and the presence of bacteria in the tubules and not in the blood vessels seems to argue in favor of an ascending, rather than a hematogenous, infection."

DISCUSSION.

Isaac A. Abt, M.D., Chicago.—It would be well to cystoscope the bladder and learn something as to the nature of the bladder wall and also as to the orifices of the ureters, particularly in female children. The expert cystoscopist can occasionally throw important light upon these cases and render material aid, especially in cases where relief by operative procedure is contemplated but not clearly indicated.

A. JACOBI, M.D., New York.—Were gonococci found?

DR. WEST.—No examination was made for them. There was no history of former vulvovaginitis.

DR. JACOBI.—Undoubtedly the two belong together—the pyelitis and the vulvovaginitis. Was the uterus examined?

DR. WEST.—No.

DR. JACOBI.—It is a very common experience not to find a vulvovaginitis when it has existed for weeks and months perhaps. That is a result of the fact that the process is very frequently limited at that time to the uterus. The gonococci are stored away in the uterus. Up to the seventh to ninth year the mucous membrane of the uterus is not a smooth surface, but is in folds so that the gonococci may easily be buried in these folds and not come to the surface at all for weeks and months. That is the explanation of why we frequently think we have cured a case, when all at once it breaks out again—the gonococci could not be reached at all. There may be a gonococcal metritis a long time before it makes its appearance.

CHARLES G. KERLEY, M.D., New York.—Dr. West's case reminds me of one that I was called upon to autopsy. The child was supposed to have had malaria. There was a typical malaria chart, but autopsy showed extensive cystitis and multiple nephritic abscesses.

OPHTHALMIA NEONATORUM TREATED BY ZINC IONS.—H. K. Ramsden (*British Medical Journal,* November 7, 1908) describes the recent treatment of a case, claiming that many cases of corneal opacity can be prevented by the method employed. The conjunctiva of the diseased eye was everted and a positive electrode, which consisted of some cotton-wool saturated in a 2 per cent. solution of zinc sulphate was applied. The nurse held the negative electrode in the child's hand. The battery employed was an ordinary bichromate battery, which gave twenty volts, and half a milliampere current was passed for three minutes. Twelve hours after the application the inflammation was subsiding and another application was made. Two days later the case was cured. In the author's experience the case ordinarily treated by silver nitrate or protargol applications (twice a day) would have taken fourteen days and would have been an anxious one.—*Medical Record.*

CHARTS OF THREE CASES OF PYELITIS.*

BY CHARLES GILMORE KERLEY, M.D.,
New York.

Among the difficulties in diagnosis encountered by those who work with children, obscure elevation of the temperature stands out prominently, and an explanation of such obscure elevation of the temperature over the normal may rest upon the presence of pyelitis, a disease not infrequently found in female children.

Among the cases of acute pyelitis which have come under my observation there were certain features which were characteristic of all the cases.

First: All occurred in female children.

Second: All were under four years of age.

Third: All gave the history of a preceding fairly severe acute intestinal infection.

Fourth: All appeared well excepting when temperature was active.

Fifth: All showed pus in the urine.

Sixth: All gave the history of, or showed, an indefinite and irregular temperature, a temperature that might be high or low; it might be high in the morning and low in the evening. In fact, the characteristic of the temperature was its extreme variableness when active, followed by intermissions of normal temperature periods.

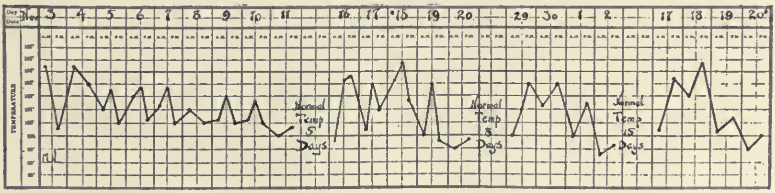

CHART I.

CHART I. is that of a child thirteen months of age, my own patient, who had a severe colitis. This was followed by a rise in temperature, which was found to be due to a pyelitis. The child had four distinct temperature periods as shown by the chart. She never appeared ill and was only restless and unhappy when the temperature was high. There was no prostration, and very little loss in weight. This patient recovered under the use of urotropin—grains ii, six doses daily. At one time the urotropin was discontinued for six days, citrate of potash, 12 grains daily, being given. As no striking improvement occurred, the urotropin treatment was resumed.

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* Presented before the New York Academy of Medicine, Section on Pediatrics, January 14, 1909.

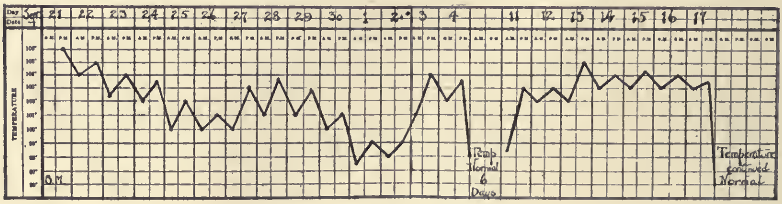

CHART II.

CHART II. is that of a girl eighteen months of age, the daughter of a physician. She had a severe attack of colitis two weeks preceding the first temperature period in this chart. I saw her for the first time during the second temperature period. The story was so typically one of pyelitis that I ventured a diagnosis of pyelitis to the father without a urine examination. Pus was found in the urine in plenty. The child recovered promptly under urotropin—grains ii, every two hours, six doses daily.

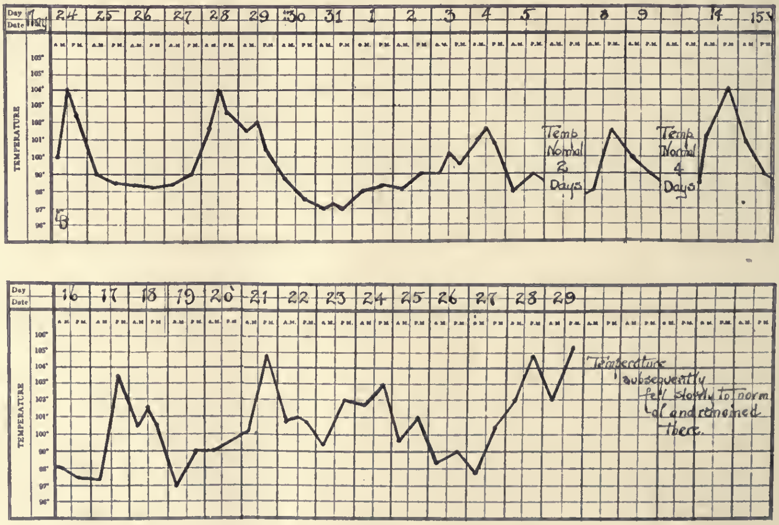

CHART III.

CHART III. tells the temperature story of a girl twelve months of age who had been ill with a fever for two or three months. The fever, according to the parents, would come and go. There would be a temperature of 100° to 104° F. of three to four days' duration, and then a normal temperature for a week or so. The child had been treated for intestinal infection, malaria, etc. She was in rather poor condition as a result of the prolonged illness. With her, the progress toward recovery was very slow, three months being required before she could be considered well. The treatment was with urotropin, as in the preceding cases, 12 grains being given daily for five days, with an interval of rest from treatment for five days, when the urotropin was resumed.

THE DIGESTIVE POWER OF THE STOMACH JUICE AT DIFFERENT TEMPERATURES.—Roeder (*Archiv. f. Kinderheilk,* Vol. 46, H. 3-6, 1907). The artificial feeding of infants presents two important problems, the first concerning the proper temperature of the food, the second involving the correct estimation of the temperature relations of a given article of diet. The former point was studied by means of animal experimentation. A dog which had been operated upon according to Pawlow (gastric cul-de-sac) furnished the stomach juice, which was added to solutions of casein at different temperatures. It was found that temperatures of 36-38 degrees C. are the most favorable for the peptic effect of the stomach juice, and that artificial food warmed to this point must, accordingly, be the most suitable for the infant. As a matter of fact, milk obtained from a nursing mother's breast presents these temperatures. It is a matter of common experience, however, that in the majority of all cases of artificially-fed infants the food is administered at a higher temperature. Among 200 corresponding cases, which were investigated in this particular connection, the temperature was 36-39°C. in 40 instances, 39-40° in 60, 41-42° in 68, 43° in 25, and 46° in 7 instances. With special reference to the estimation of the temperature, the author points out that the customary method of testing the food by the thermic sense (hand, cheek or eyelid) is absolutely unreliable, since individual fluctuations, to a notable degree, are the rule rather than the exception.—*Medical Review of Reviews.*

A CASE OF MILIARY TUBERCULOSIS DIAGNOSED BY FINDING TUBERCLE BACILLI IN THE BLOOD.*

BY ALFRED F. HESS, M.D.,

New York.

A child of three and one-half years was admitted to the hospital on December 10th with high fever. The family history was negative, as was the previous history. It was learned that for three weeks the child had been running a temperature of from 101° to 104°, and had suffered from some abdominal pain and from constipation. There had been no vomiting, no headache and no cough until the past few days. On examination the patient was found to be slightly cyanotic. Temperature, 103°; pulse, 160; respiration, 60. Heart and lungs were normal, and the abdomen negative, except for some enlargement of liver and spleen. Diagnosis was suspended. The child did poorly, lost weight, developed some subcrepitant râles and ran a high temperature. The Widal reaction was negative; the Ehrlich reaction positive. A blood count showed 3,200,000 red cells, hemoglobin, 75 per cent., and leukocytes, 7,600, of which 65 per cent. were polynuclear. After some days of observation the diagnosis was still uncertain, wavering between miliary tuberculosis, typhoid fever and sepsis. On the 14th 2 c.c. of blood was taken from the finger tip and collected in 10 per cent. sodium citrate solution. At the same time 30 c.c. of clear fluid was withdrawn by lumbar puncture, although the child presented no signs of meningitis—no paralyses, no irregularity of pulse or respiration, no rigidity of the neck, no increase in the tendon reflexes. The blood was centrifuged, and the sediment smeared thickly on a slide and allowed to dry. The hemoglobin was then removed by immersing the slide in a solution of 2 per cent. acetic acid and ½ per cent. formalin. This method was found to be by no means perfect, and in some cases the entire preparation was washed away. However, some satisfactory preparations were obtained. The smear was then lightly fixed with heat and stained for tubercle bacilli in the usual way. After a search of about twenty minutes two tubercle bacilli were found, and again one bacillus in another part of the field. These bacilli were definite and were seen by Dr. Park and others in the laboratory. No bacilli were seen in smears of the cerebrospinal fluid, and it was injected intraperitoneally into a guinea-pig. After five weeks this pig was killed, and showed lesions of early tuberculosis, which contained tubercle bacilli. The remainder of the cerebrospinal fluid, which had been preserved, was now reexamined and found to contain tubercle bacilli.

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* Reported at the Meeting of the New York Academy of Medicine, Section on Pediatrics, January 14, 1909.

Thus we have a case in which the diagnosis of miliary tuberculosis was at once established by finding bacilli in the blood and in which, furthermore, tubercle bacilli were found in the cerebrospinal fluid, although clinically there was no symptom of meningitis. Whether meningitis existed cannot be decided, as no autopsy was performed, for the child was taken from the hospital on the 16th and died at home two days later. It may be that tubercle bacilli can be present in the cerebrospinal fluid when the meninges are not involved or are the seat of such early lesions that recovery is possible; this may explain some of the cases of cured tuberculous meningitis which are sparsely scattered throughout the literature.

HOME TREATMENT OF SCARLET FEVER.—R. Milne's paper (*British Medical Journal,* October 31, 1908) is a plea for the use of a carbolized oil of 10 per cent. strength, or eucalyptus oil, rubbed into the skin. He tells the nurses and parents, "rub the patient most carefully from the crown of the head to the soles of the feet," including the armpits and the roots of the hair. The rubbings are to be made morning and evening for the first four days, then once daily till the tenth day. The throat is to be swabbed with the carbolized oil every two hours for the first twenty-four hours. With this plan of treatment the author has never seen any nose, ear, or kidney disease. The severity of the attack is greatly modified. He claims that the treatment dispenses with the need of elaborate disinfection afterward, for the source of infection is destroyed (?). No carbolized sheets are hung in the doors of the sick room. Diet is restricted to soda water or equal parts of hot milk and water. Light diet is allowed in a few days and ordinary meals on the tenth day. As between carbolized and eucalyptus oils, the author has come to prefer the latter. He supports his proposition by the histories and courses of various institution and village outbreaks of the disease.

A CASE—APPARENTLY OF TUBERCULOUS MENINGITIS—IN WHICH THE AFTER HISTORY MAKES IT PROBABLE THAT THE DIAGNOSIS WAS MISTAKEN.*

BY EDWARD M. BUCKINGHAM, M.D.,
Boston, Mass.

The patient, a boy of seventeen months, had malaise for one to two weeks, with cephalic cries. April 10th, Dr. J. W. Redmond was called because of some shuffling in walking, confined to one foot. No tenderness. In the next four days there were vomiting and convulsions. No history of tuberculosis nor of syphilis. Dr. Redmond asked me to see the child on the 14th. The difficulty in walking had then nearly disappeared; there was strabismus; the pupils were dilated and sluggish, the right being more dilated than the left. Knee jerks were unequal, the right being most marked. Kernig sign marked. Babinski present, but slight. Head not retracted. Ears and gums negative. Provisional diagnosis of tuberculous meningitis. Lumbar puncture was performed, the fluid running at first under considerable pressure; perhaps 10 or 12 c.c. withdrawn.

The pathological report by Dr. Leary is as follows: Specimen received from Dr. Redmond consists of 3½ c.c. of clear, colorless, watery fluid. This was shaken down in a centrifuge, without obtaining any visible sediment. The lower portions of fluid were smeared on slides and stained by Wright. Careful search resulted in the findings of eighty-nine cells, all but three of which were lymphoid cells. Diagnosis: Chronic inflammatory, probably tuberculous, meningitis.

The pressure symptoms were very quickly relieved, and in about a week the child had recovered health. He remained well May 20th, when Dr. Redmond last saw him. This after history is compatible with its being one of the comparatively few cases of cerebrospinal meningitis, in which there are prodromal symptoms and in which the cerebrospinal fluid contains an excess of mononuclear cells.

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* Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 25, 1908.

HOSPITAL MEMORANDA.

From the Medical Wards of the Babies' Hospital.

TWO CASES OF INFLUENZA PRESENTING UNUSUAL ASPECTS.

BY JOSEPHINE HEMENWAY, M.D.,
New York.

Male, nine and one-half months old, weighing 10½ pounds. The feeding history was unimportant, except that for the past four months there had been no gain in weight. It was possible to follow the entire course of the disease, as the child was brought to the hospital at the onset of the cough.

For the first six days he was treated as an ordinary acute bronchitis. Then a double otitis media developed and paracentesis of each ear-drum was performed. Pneumococci were found in the pus from each ear. Three days after this the temperature began to show wide daily fluctuations.

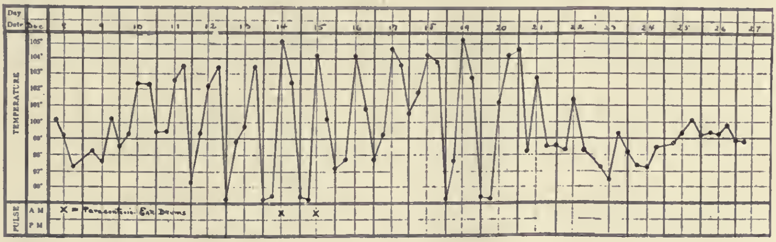

CHART OF CASE I.

The accompanying temperature chart shows, at times, a variation of from 95° to 105° in twelve hours. No hydrotherapy was used except an ice-cap to the head. For twelve days this irregular temperature persisted, yet at no time did the child appear acutely ill. Cultures from the posterior pharynx showed practically pure cultures of the influenza bacillus.

The leukocytes ranged from 12,000 to 22,000, the polymorphonuclears from 70 per cent. to 75 per cent. Constant, careful examinations of the lungs were made, but only a few scattered râles heard until after ten days of this temperature, when a small area of consolidation appeared in the right axilla, which disappeared after five days. The ears were carefully watched by the aural surgeon and, as the drums showed great tendency to close, in spite of constant irrigations, several subsequent incisions were made. These paracenteses had no effect upon the temperature. Sinus thrombosis was considered, and it was suggested that, had the child been under the care of many ear specialists, the operation for this lesion would have been done.

This temperature, with an otitis media existing and no other definite lesions found, would have been considered by some as sufficient ground for a diagnosis of sinus thrombosis. The temperature fell to normal on the thirteenth day and has remained normal since, with the exception of a slight rise in the next week. The child at present, though rather prostrated from the severe attack, is gaining slowly in weight, the ears are normal and nothing further of interest has developed.

CASE II.—INFLUENZA WITH AN ACUTE HEMORRHAGIC NEPHRITIS.

The child was a well-developed girl of four years. She had been the subject of many attacks of acute bronchitis, but there was no history of any contagious disease.

In the early part of December, 1908, there was noticed an acute coryza, tenderness of the cervical glands and slight cough. Two days after this the urine became "coffee-colored" and the temperature rose to 103°F. The child was brought immediately to the hospital.

For two days the temperature ranged between 103°F. and 104°F.; there was a slight general bronchitis; the heart was markedly irregular in rhythm, with a soft blowing systolic murmur; and the child looked prostrated. The urine was scanty, very dark and blood-tinged, with a large amount of albumin. Microscopic examination showed many casts, both hyalin and granular, and red blood cells. The specific gravity ranged between 1.030 and 1.035. Catheterized specimens of urine were obtained, but no influenza or other organisms could be found by culture.

The interesting point about this case is that influenza organisms were grown by culture from the posterior pharynx and are considered to be the etiological factor in the development of the nephritis. After four days the temperature became normal and remained so; after two weeks the pulse became regular; but the systolic murmur could be heard over the precordial area for a period of three weeks. The improvement in the condition of the urine was marked, and one month after onset nothing abnormal could be found.

There was apparently complete recovery. The child has been followed for one month after discharge from the hospital, and the urine remains normal.

EDITORIAL.

2-2-5

CHILDREN WHO NEED NOT HAVE BEEN BLIND.

"One-quarter of all the blind children in all the blind schools in this country are unnecessarily blind."

With this statement the special committee on the prevention of blindness of the New York Association for the Blind opens its second printed communication. This committee states its object to be "to ascertain the direct causes of preventable blindness and to take such measures in conjunction with the medical profession as may lead to the elimination of such causes." It has prepared a pamphlet of some twenty-six pages on the subject illustrated by pictures of children who have become blind unnecessarily, which contains much food for reflection, and which should help bring to the profession and to the laity the need for adequate legislation for the control and prevention of such pitiful calamities.

Treating of ophthalmia neonatorum chiefly, the report shows that in 1906, twenty-three years after Crédé had reported that with the application of a suitable solution of silver salts, this disease had developed in but 2 children in a series of 1,160 births, 1 out of every 200 children born in New York State had ophthalmia! In this same year the cases of blindness from this cause, according to the official census for the State of New York, were 10 per cent. of the total number of cases of blindness. In 1907, among the new admissions to ten schools for the blind, 25.21 per cent. were victims of ophthalmia. In eight years (1900-1907) at the Pennsylvania Institute for the Blind at Overbrook, 33⅓ per cent. of the admissions were needlessly blind from ophthalmia.

The problem of changing such a condition of affairs the committee plans to approach by education, by legislation and by inviting the coöperation of all medical men and societies. Public lectures, the distribution of printed matter and articles in the press will be used to spread among the public the knowledge of the ravages of the disease and its easy preventability. Legislation will be urged to prevent lack of care on the part of doctors and midwives and to place the departments of health in a position to demand prophylaxis and to oversee its carrying out.

The recommendations made by the committee are in accord with the recommendations already made by the American Medical Association, the Medical Society of the State of New York and the State Board of Health, and cover the regulation and licensing of midwives, the distribution of circulars of information by the boards of health, the free distribution of prophylactic silver salts for immediate use in all births, and the early notification of births. The committee dwells with emphasis upon the need of this last and most rightly. No one thing would do more, provided legislation were in effect empowering boards of health to act in the matter, than early notification of births. The present law requires the notification of all births within ten days, which time is often exceeded. There is in this interval more than sufficient time for ophthalmia to do its awful work. If notification of all births within twenty-four hours were made compulsory and sufficient penalty exacted to compel its being done, the departments of health could, through their inspectors, insure that every child received the necessary prophylactic treatment at once, and many children would be saved from blindness and a life as a burden to the State.

The committee is at work on the right problem in the right way. It ought to succeed.

OBSERVATIONS ON NURSING WOMEN.—S. Jacobius (*Arch. f. Kinderheil.*, Bd. LXXXIV., H. 1 and 2), after observations on many nursing women who had given up nursing their children for some reason, not always a good one, finds that menstruation begins in many women soon after the puerperium, and in the majority of women before six months. The production of milk does not seem to be materially affected by its presence. In the clinic for infants at Berlin, where prizes are offered for the longest nursing of the children, the author has never seen a case in which it was necessary for the mother to stop nursing the child on account of the beginning of menstruation. It was also noted that when a mother has ceased nursing for an interval even as long as thirty days, it is possible for her to revive the flow of milk and to again nurse the child. Such a procedure is not injurious to the child, the secretion seeming not to have so changed as to do it any harm.—*Journal Medical Society, New Jersey.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Abstract of Report of Stated Meeting, Held January 14, 1909.

Eli Long, M.D., Chairman.

ADENOIDS IN CHILDREN.

Dr. Rowland G. Freeman said that adenoid hypertrophy in children was very frequent in New York, and that indications of its presence usually appeared during the first year. It was very important that adenoids should be removed just as soon as they gave symptoms and before mouth breathing became a habit. There were certain symptoms which would call attention to this condition. Perhaps the earliest symptoms occurring during the first year were the snuffles and snoring, particularly occurring at night. In another class of cases, there were the frequent colds. Then again, there was paroxysmal cough, in attacks resembling whooping-cough.

Dr. Freeman reported a case of a child who had such attacks. The paroxysms were very severe and prolonged, and during them the child became very cyanotic. With the cough there was expulsion of whatever food had been taken. Adenoids of large size were found and the mother was told that they should be removed, although on account of its desperate condition the child might die during the operation. The operation was done without any anesthetic, as could be done during the first year without frightening the child. The use of anesthetics in children should be guarded, especially in those of lymphatic constitution; as sudden death might occur in the latter. If an anesthetic were used, nitrous oxid gas was to be preferred. After the removal of the adenoids in this case relief of the cough was almost immediate, there was no more vomiting, food was retained, and since the operation, performed on October 24th, there had been a gain of three pounds.

Dr. William P. Northrup said that the operation for adenoids was an easy one, and there seemed to be no excuse for not doing it in these cases of snufflers and snorers, and he wondered why it had not been done more often. Dr. Freeman's results were certainly very satisfactory.

UNUSUAL ASPECTS OF INFLUENZA.

Dr. Josephine Hemenway reported 2 cases. (See page 223.)

Dr. Charles Herrman, discussing the first case reported by Dr. Hemenway, said that cases of influenza with marked remissions of temperature were not so extremely rare. During an epidemic of influenza, if a child was presented with this peculiar type of temperature curve, he said he would be strongly inclined to the diagnosis of influenza from this alone.

CASE OF CONGENITAL BLUE BABY.

Dr. William P. Northrup presented a girl of eleven years who was always blue and cold and suffered from anorexia and attacks of complete exhaustion. On examination before his clinic, he was surprised not to hear a heart murmur. It has been Dr. Northrup's experience that when a child was born blue and stayed so, the lesion was narrowing of the pulmonary artery and an incomplete ventricular septum. Murmurs might or might not be present.

Dr. Rowland G. Freeman said he believed that all the men who had served as pathologists at the Foundling Hospital had been convinced of the wisdom of the teaching of Dr. Northrup concerning the common lesion in congenital heart cases. He had now a case similar to that presented, a blue baby of three months, with no murmur. Dr. Morse, of Boston, reported having followed 32 such cases of congenital heart defect; several of the cases had heart murmurs which disappeared later in life. This seemed to indicate that they had recovered from the condition.

CASE OF CONGENITAL PYLORIC STENOSIS.—OPERATION.—DEATH.

Dr. Henry Dwight Chapin reported this case. The baby was first seen at the dispensary of the Post-Graduate Hospital when two months old, and a diagnosis of pyloric stenosis was made. The baby was breast-fed for three weeks after birth. Labor was normal. The child had projectile vomiting which had increased. One hour after each feeding the baby would vomit what food had been taken: She had six stools a day. The physical examination showed an enlarged abdomen, and visible peristalsis was noted. Changes in feeding did not affect the vomiting. An X-Ray plate following a large dose of bismuth gave no help.

Dr. Putnam operated. The child lived but a few hours after operation. The stomach was shown, together with slides. There was found an increase of connective tissue and infiltrating cells at the pyloric end of this organ.

Dr. Charles R. L. Putnam said the baby weighed only 5½ pounds at the time of operation and was extremely anemic and weak. They had tried to feed the child for three days to improve its condition, but vomiting was persistent. Before operation the stomach was washed and then a Heineke-Mikulicz pyloroplasty was done. The stomach was found to be much distended with gas. A tumor presented at the pylorus. This was felt only when the child was under ether. Dr. Putnam described the operation.

In these cases of pyloric stenosis Dr. Scudder of Boston believed in the operation of gastroenterostomy. Dr. Nicoll, of Glasgow, had had success in these cases in doing a submucous pyloroplasty. The best end results were obtained, on the whole, when the pylorus was left as nearly normal as possible.

Dr. Dennett said that they had seen during the last year 3 such cases of pyloric stenosis, and in all the peristalsis was noted as going from left to right. There was no reverse peristalsis in these cases. Tumor was not felt at any time.

Dr. Charles Herrman said that some authors had endeavored to differentiate sharply between cases of pyloric stenosis and pyloric spasm. The case described by Dr. Chapin showed how difficult this might be. The question of time for operation arose in these cases of pyloric stenosis. Characteristic cases may get well without operation. He thought, however, that it was better to attack these cases early rather than to wait and take any chances without operation.

Dr. Godfrey R. Pisek believed that by distending the stomach with a considerable amount of pabulum and so endeavoring to get some of it through the stenosed orifice, some relief might be obtained. Getting some food through there would follow an increase in nutrition, thus assisting the child's chances. Further, the method may aid in making the diagnosis.

Dr. Eli Long said that because of the high mortality which attended these operations in infants, an early and exact diagnosis should be made before operation was considered.

A CASE FOR DIAGNOSIS.

Dr. Edward D. Fisher presented a boy thirteen years of age. The mother and an older brother had pulmonary tuberculosis. The patient was a premature child, born at the seventh or eighth month. At birth he was very feeble, weighed about 2½ pounds, and for one month was fed with a medicine dropper. After he was one month old he gained flesh and strength rapidly. He had his first tooth when two years old, and was first able to sit up alone then. With each double tooth he had convulsions. He did not talk until five years old. At this age he had a mild attack of measles. Otherwise he was well up to seven years of age, although mentally deficient and undersized, when he had scarlet fever and convulsions, and was confined to his bed for about three months. After one convulsion of great severity he was blind for one week. At this time he complained of great pain in the back of his head at a point where the mother thought she could feel a protrusion and throbbing. At this time the patient began to pass large amounts of urine and to drink correspondingly large amounts of water. Otherwise the patient remained well up to last summer, when he had one convulsion in the night. He was up and about the following morning, but complained of pain in the leg. The mother then noticed that he walked unsteadily, throwing the leg outward. During the past few months he had gained in flesh and strength, and walked without assistance, which was impossible three months before. Repeated examinations of the urine showed nothing abnormal except the large quantities of urine passed. An examination of the eyes showed a slight cloudiness of the optic disc. On examination there was noted nystagmus, intentional tremor, a spastic gait, exaggerated reflexes, and a peculiar hesitating speech. The patient was very emotional, mentally deficient. The diagnosis was cerebral diplegia. A possible diagnosis of multiple sclerosis was suggested, but it should be remembered that while this disease did occur in children, it was comparatively rare, and Dr. Fisher said he never knew of a child who was born with that condition. In this case he thought that it was possible that the cerebral diplegia followed by an attack of scarlet fever had resulted in multiple sclerosis.

Another diagnosis possible was a basal growth near the floor of the fourth ventricle of tubercular origin. This might explain the diplegia and the polyuria. It was interesting to note that the child had lately developed mentally, which was opposed to the diagnosis of multiple sclerosis, which disease was progressive, marked by increasing mental weakness.

Dr. Alfred F. Hess said that some years ago he had seen a premature child with the same kind of a gait, staccato speech and a backward mentality. The child had difficulty in walking, especially in going up stairs. A prominent neurologist refused to give any positive opinion regarding the nature of the disease, but thought it might be one of multiple sclerosis or cerebellar ataxia of the Marie type.

Dr. William Van Pelt Garretson said that the patient presented by Dr. Fisher had been seen at the Vanderbilt Clinic and there regarded as a case of multiple sclerosis. The early history of the child was indicative of delayed development. There was a slight pulsation over the torcular herophili where the bone was imperfect. Some involvement of the peroneal group of muscles persisted. Since the scarlet fever the boy had developed a classical picture of multiple sclerosis, which occasionally occurs after severe infections. The fundi showed the characteristic crescentic haziness described by Gnauck as being present in disseminated sclerosis. Nystagmus was present. The syllabic-staccato-scanning speech, the very marked intentional tremor, the emotional instability, the spastic condition of the extremities, the ataxic gait, the presence of Romberg's sign, the very active patellar reflexes, ankle clonus and Babinski's sign with no sensory disturbances, made an unmistakable picture of multiple sclerosis. The polyuria was to be explained by the irritation from a placque of sclerosis in the medulla.

TEMPERATURE CHARTS FROM CASES OF PYELITIS.

Dr. Charles Gilmore Kerley demonstrated these. (See page 217.)

A CASE OF MILIARY TUBERCULOSIS DIAGNOSED BY FINDING TUBERCLE BACILLI IN THE BLOOD.

Dr. Alfred F. Hess reported this case. (See page 220.)

A CASE OF INFANTILE PARALYSIS INVOLVING THE MUSCLES OF THE FACE AND EXTREMITIES.

Dr. Henry W. Frauenthal reported this case, one of a series of 16 collected in the past two years (photographs of twelve shown.)

The boy was first ill at the age of fourteen months with infantile paralysis, which involved both right extremities and all the muscles of the right side of the face and right eye. The chief facts of interest in this case were that up to six months ago he could not close his right eye and had no vision in that eye, and all the muscles on the right side of the face were paralyzed.

He was carefully examined by two physicians at the Hospital for Deformities and Joint Diseases, who claimed that he gave positive reaction of total degeneration and there was no hope for any improvement, so it would be a waste of time to treat the boy. However, under skilled massage, combined with high frequency and sinusoidal electricity, he has slowly improved, is able to close his eye completely and distinguish objects clearly with his right eye.

The location and character of the lesion in the brain for these facial involvements is not known and no autopsies have been obtainable. This case is interesting for the following reasons:—

(1) It is stated in all text-books on anterior poliomyelitis that if paralysis exist for six months or a year without improvement none will take place under any form of treatment.

(2) That when positive reaction of degeneration in paralyzed muscles exists there can be no hope for improvement or recovery.

The Local Use of Magnesium Sulphate in the Treatment of Erysipelas, With Report of Cases.—A. Tucker, Philadelphia (*Therapeutic Gazette, June* 15, 1908). With this treatment the pain and discomfort are relieved in a few hours, the temperature falls to normal rapidly, usually within the first twenty-four hours, and the patient recovers in from two to seven days. The method of application is as follows: A saturated solution of magnesium sulphate is applied on a mask consisting of fifteen to twenty pieces of ordinary gauze; this is covered by some non-absorbent material and kept wet as often as necessary. No other treatment is necessary. The report is based on observations upon 35 cases.—*Journal Medical Society, New Jersey.*

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THE PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, February 9, 1909.

J. CLAXTON GITTINGS, M.D., PRESIDENT.

INSPIRATORY DYSPNEA IN INFANCY.

DR. A. D. BLACKADER, of Montreal, Canada, read a paper, by invitation, on inspiratory dyspnea during infancy, with special reference to congenital laryngeal stridor and so-called thymic asthma. He reported 5 cases of congenital stridor which had come under his observation, and called attention to the symptoms differentiating this affection from laryngospasm and also from the various forms of difficult or spasmodic breathing due to acute and subacute inflammatory conditions of the upper air passages. He regarded the cause of the stridor as almost entirely mechanical and stated that in congenital laryngeal stridor we have to deal with an exaggeration of the normal infantile type of larynx due to defective developmental conditions and not dependent upon any spasm or incoördination of the respiratory muscles. The stridor itself appeared to be due to the vibration of the aryepiglottic folds which on sudden and deep inspiration become sufficiently tense to give a high note; the character of the sound was variable and was dependent partly upon the condition of the folds themselves, partly on the amount of stenosis present, and partly on the degree to which the membranes were stretched. Of the total number of cases, including his own, in which the age is recorded, he finds that 64 per cent. occurred during the first week and 28 per cent. during the second week. The delay in appearance may be attributed either to defective observation on the part of the nurse, or defective inspiratory power on the part of the infant. On one of his cases another child in the family was said to have died at the age of four months from an attack similar to the one then experienced by the infant in his charge. Refslund states that a similar condition was also present in the brother of the infant that died under his care, but Ceri in his review states that he does not know of any other instance where a possible hereditary influence manifested itself. Thomson does not consider the affection as one of serious import to life; nevertheless, one-sixth of the cases reported have died of affections of the respiratory system. In all cases except the very mildest, we find distinct indications of impediment to the entrance of air manifesting itself in defective expansion of the air cells at both bases, a condition which most predisposes to acute disease and one also which tends to retard normal growth and development.

In cases with severe suffocative attacks the possibility of a fatal obstruction must be considered by the physician. Such cases should be sent into a hospital where any sudden emergency could be quickly met and kept there till the danger lessens with advancing age and development.

The question of the amount of influence that an enlarged thymus may exert during infancy on the respiratory tract in the production of dyspnea and stridor, has for a long time interested the profession. Pathologists generally have questioned the possibility of an enlarged thymus exerting direct pressure on the trachea. A few cases, however, have been reported within the past decade where at autopsy indications of distinct compression were found. Very recently also Chevalier Jackson, of Pittsburg, has given us a convincing bronchoscopic demonstration of the occasional existence of such compression, a compression which in his case was relieved by resection of the gland. Compression may occasion distinct stridor, but such stridor will differ markedly in its character from that of congenital stridor. It has been described as of an unmusical, sawing character, is present at both expiration and inspiration, is persistent and is uninfluenced by sleep. Careful observation will also show that movement of the larynx is much restricted. Intense dyspnea with cyanosis often develops. Compression by enlarged bronchial glands may give rise to very similar symptoms.

Dyspnea associated with, and apparently due to, an hypertrophy of the thymus is occasionally met with, without any actual stridor. Two cases of such severe dyspnea with cyanosis, ending in sudden death, were reported. The question of the etiology of such cases was discussed.

Dr. J. H. Jopson said that he had long been interested in the operative treatment of respiratory obstruction in infants. One case which he had seen in the Presbyterian Hospital, with continuous stridor, recovered. He had seen another case, occurring in the practice of Dr. E. P. Davis, and seen in consultation with him. This patient had the classical symptoms of congenital laryngeal stridor, as described by Thomson, coming on at the age of three weeks. Another child had died of congenital heart disease, but aside from this the family history was good. The condition in this child was so acute at times, especially when she was excited or disturbed, that operation was seriously considered and Dr. Jopson was in almost constant attendance for days. The child was finally taken to the mountains and ultimately made complete recovery.

It is noteworthy that these cases often succumb to other respiratory infections. A distinct malformation of the larynx is apparently found when these cases come to autopsy. In a large group of cases difficult to distinguish from thymic asthma, rickets or adenoids are usually present, together with some additional acute infection, as influenza. He mentioned a family of children in all of whom laryngeal obstruction occurred at some time during infancy.

Dr. J. P. Crozer Griffith has been most interested in thymic death. He agrees with Dr. Blackader that some cases have had stenosis follow pressure of the thymus gland, with sudden death, with symptoms of laryngismus stridulus. But children with a large thymus may die of something else, even suddenly. Dr. Griffith says that status lymphaticus does not kill; the enlarged thymus is not the cause of death, but some neurosis or some cardiac action.

Dr. B. F. Royer has seen no case as young as two weeks. He saw a child of five months, who had recovered from his laryngospasm; later this child died very suddenly. Dr. Royer detailed the histories of several cases in which the exact diagnosis was obscure.

Dr. B. A. Randall said that the most germane case he had seen was that described by Dr. Jopson. In her his laryngeal mirror had given but a poor view, but it showed the enlarged varicose veins within, such as constituted the nevoid condition of cheek and neck. On this account he advised the internal use of adrenalin, especially as a little adrenalin in the nose notably helped respiration. Laryngoscopy should be tried, although it often fails to show the parts below the narrow epiglottis, as this is the limit for palpation, for neuroses, or even paralyses, may occur in young children, as with the abductor paralysis seen in adults after typhoid. Severe dyspnea must be relieved without too much delay, lest, besides carbon dioxide intoxication, clot may form in the heart or pulmonary artery with sudden death. In these cases, as in diphtheria, mercurial fumigations with calomel may aid much.

Dr. Theodore Le Boutillier reported a case of laryngeal stridor in an infant of five months. He had had a laryngeal cry for some months, associated with rickets and craniotabes. The stridor was noted again at seven months, when the child died suddenly, with cyanosis, after increasing stridor.

Dr. D. J. Milton Miller spoke of an infant with laryngeal stridor who had been under his care for three months. As the child grew stronger, the stridor decreased markedly. He sees very little resemblance between laryngeal stridor and thymic asthma, and they should not be confused. He does not believe that the symptoms of laryngeal stridor are due to pressure of an enlarged thymus. If they were, it would be a more frequent affection, as enlarged thymus gland is very common, at least comparatively so. He believed the dyspnea of enlarged thymus due to the same cause as thymic death to a toxin.

Dr. C. B. Farr said that he had seen a child of eight in whom the thymus weighed 30 grams and the heart 70 grams. There was general enlargement of all the lymphoid structures and slight hypostatic congestion of the lungs. Onset was sudden, with coma, convulsions, leukocytosis (45,000), hyperpyrexia and death. (Case of Dr. Fife.)

Dr. S. McC. Hamill spoke of a form of laryngeal obstructive breathing which he had observed in association with certain infections in newly born and young infants. He referred to it because of the statement which Dr. Jopson had made relative to the increase he had noted in the stridor of infants suffering from congenital laryngeal stridor in the occurrence of superadded infections.

Dr. Hamill believed there was little likelihood of the obstructive breathing of the type referred to being confused with the congenital laryngeal stridor, but he had observed instances in the infections of the newly born which might very readily be confused with the so-called thymic asthma. In these cases the onset of the spasm had been acute, severe and associated with marked cyanosis, sometimes resulting in sudden death, after these symptoms had existed for a comparatively short time.

He had sometimes observed at the postmortem examination of these cases quite marked enlargement of the thymus gland, but in no instance was there evidence of the gland producing sufficient pressure to account for the symptoms. That they were not dependent upon the presence of an enlarged thymus he had demonstrated by frequent autopsies in cases in which there was no enlargement of the thymus. In one very striking case of streptococcic infection in a newly born child, he had observed the complete cessation of the obstructive breathing and the disappearance of the cyanosis during the process of removal of 2 c.c. of blood for purposes of bacteriological study. This made it evident that there was no association between the presence of an enlarged thymus and these obstructive manifestations.

On the contrary, these facts point to an infectious origin, but he was unable satisfactorily to explain the manner in which such infections brought about these results. He referred to the case of a marasmic infant which he had observed within the past two days, which, after having remained in a stationary condition for some weeks suddenly developed what seemed to be obstructive breathing, associated with a certain amount of stridor, but without cyanosis, and associated with a very marked drop in the temperature; and thereafter a marked fluctuation of the temperature occurred between the normal point and 95°. The obstructive breathing persisted until the time of death, which occurred suddenly; but the autopsy showed nothing to account for the peculiar type of breathing. Cultures from the heart blood, however, yielded a pure growth of a staphylococcus. This emphasizes still further the fact that these manifestations may depend upon infectious conditions which are not associated with a rise in temperature and without symptoms that would throw any light upon the nature of the condition. He thought, further, that these cases suggested the possibility of an infectious or toxic origin of thymic asthma.

Dr. R. S. McCombs reported a case in a child convalescing from typhoid fever at the Children's Hospital, who developed a sudden attack of laryngeal obstruction accompanied by cyanosis and symptoms of asphyxia. He intubated, the tube remaining in position for three days; when it was removed there was no reappearance of symptoms. A curious accident occurred during intubation, the obturator holding the intubation tube in position being found missing after intubation. The child did not pass it in the stools, it was not in the bed clothing, nor was it ever found. Dr. McCombs though it possible that the obturator had slipped through the tube into the trachea.

Dr. W. M. L. Coplin said that the weight of the thymus gland does not show its possible pressure. The shape of the gland may show compression on the trachea. The gland also differs, whether it is distended or not.

Dr. C. E. de M. Sajous called attention to a cause of laryngeal obstruction in adults, a swelling of the tissues on the under side of the larynx, thus causing the laryngeal aperture to become narrowed. This is sufficient at times to require tracheotomy, as in a case reported by Leccarret in 1894. The subglottic region being prone to hyperemia and edematous infiltration in adults, especially during the use of the iodids, it must be the seat of corresponding disorders in children. This cause of asphyxia may have prevailed in some of the fatal cases referred to this evening.

Dr. Blackader, in closing the discussion, called attention to the fact that in pure congenital stridor there was little or no spasm, a condition which differentiated it from laryngismus stridulus. He admitted that those cases of sudden death, in which an enlarged thymus had been found without other detectable pathological condition, might eventually prove to be cases of general infection.

Diet of Nursing Women.—L. Bouchacourt (*Jour. de Méd. de Paris,* June 20, 1908) states that the diet of the nursing woman should be most abundant, but its quality is also important. Vegetables should be the most important part of it, meat being of less value in producing milk. Of the vegetables that produce the milk, lentils, cotton-seed oil cakes, carrots, beets, chicory, parsley, peas and beans are the most valuable. Cod liver oil is also valuable. The author believes that milk and light beers and ales are galactogogues. He would arrange the diet thus: Bread, 400 grams; meats or fish, 250 grams; dry vegetables, 500 grams; fresh vegetables, 300 grams; vermicelli and macaroni, 100 grams; sweet fruits and candies, 100 grams; butter, milk and cheese, 1,500 grams; beer or cider, 1,000 grams; water, 1,000 grams.—*Journal Medical Society, New Jersey.*

CURRENT LITERATURE.

Abstract in this Number by
Dr. Henry Heiman.

MEDICINE.

Lucas, W. P.: "A Study of 136 Cases of Diarrhea Occurring on the Boston Floating Hospital During the Summer of 1907." (*Boston Medical and Surgical Journal,* September 3, 1908, p. 97.)

Castor oil in large doses was almost always used in the beginning of the treatment. Calomel was given only when castor oil could not be tolerated. Irrigation of the rectum was rarely employed more than once in twenty-four hours even in the severest cases, as it seemed to have no influence in reducing the toxicity. Lavage was found of great value in those cases in which persistent vomiting was present.

Ninety-five cases were starved for an average of two and one-half days; 77 per cent. of these cases were apparently benefited by this method of treatment. The limit of starvation was of variable duration; several cases were starved for twelve days with apparent benefit. To supply the fluid need of the body during this period, subcutaneous saline infusions were frequently employed.

The author's experience with this large number of cases leads him to formulate the following conclusions:

1. The best method of treatment is careful watching. Starvation followed by a weak mixture low in fat.

2. The guide for resuming milk feeding is the general condition rather than the temperature or any one symptom.

3. Saline infusions are the most valuable adjuncts in carrying out this treatment.

4. Colon irrigation, once in twenty-four hours is beneficial, but its value should not be overestimated.

5. Lavage is very important when gastric symptoms are present.

6. Stimulation is of little value in the extreme cases.

Henry Heiman.

BOOK REVIEWS.

Practical Dietetics with Reference to Diet in Disease. By Alida Frances Pattee, Graduate Department of Household Arts, State Normal School, Framingham, Mass.; Late Instructor in Dietetics in Bellevue Hospital, New York City, etc. Fifth Edition. pp. 311. A. F. Pattee, Publisher, Mt. Vernon, New York. 1908.

This little book contains a wealth of information in regard to the preparation of foods for invalids and attempts to indicate dietaries for specific diseases and to give instruction in food values. It cannot, however, be considered a scientific treatise on dietetics and too much prominence is given to the products of the firms who advertise in the back of the book. In the instruction of nurses it will undoubtedly be helpful; and the physician may gain many suggestions from its pages for varying the diet of his patients.

Clinical Diagnosis and Treatment of the Disorders of the Bladder with Technique of Cystoscopy. By Follen Cabot, M.D., Professor of Genitourinary Diseases, Post-Graduate Medical School and Hospital; Attending Genitourinary Surgeon, Postgraduate and City Hospitals, New York. pp. 213, 41 illustrations, 1 plate. New York: E. B. Treat & Co. 1909.

In this work the author has taken up the management of the genitourinary patient with reference to prophylaxis and hygiene; the anatomy of the genitourinary organs; the essentials of urinalysis; the methods of bladder examination, with the technique of cystoscopy, giving the indications and contraindications. The greatest stress has been laid on cystitis, its causes, pathology and treatment. Attention is called to functional disorders of the bladder, and caution advised against their confusion with organic bladder troubles. There is a good chapter on the diagnosis and treatment of senile prostatic hypertrophy, in which the author advocates conservative treatment in a certain class of these cases, not failing to state when such treatment should be abandoned for more radical and curative methods.

ARCHIVES OF PEDIATRICS

APRIL, 1909.

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ORIGINAL COMMUNICATIONS.

THE HARD CURDS OF INFANT STOOLS; THEIR ORIGIN, NATURE AND TRANSFORMATION.*

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AND

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The discovery that the firm rounded curds, occurring not infrequently in the stools of infants fed upon cow's milk, are composed in part of fatty acids and soaps has led to considerable discussion and seems to warrant a further inquiry into the origin of such bodies and their subsequent transformation during their passage through the digestive tract. The claim has frequently been made of late that these masses are simply aggregations of soaps and fatty acids containing no proteid and therefore by implication are not entitled to be called curds. Although doubtless founded upon some individual tests, this view of the hard curd seems to be largely based upon the categorical statement of Czerny and Keller* in discussing "casein stools" that "these flakes and masses which have been taken for casein in the feces are not casein, but fatty soaps."

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* Read at the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 26, 1908.

It is not an uncommon experience to find in the vomited matter both of sick adults and of infants with disturbed digestions, when upon a milk diet, large firm rounded and somewhat elongated masses of rubbery consistency which are assumed to be the result of the coagulation of cow's milk under abnormal stomachic conditions. It is at least inconceivable that these vomited masses have been formed anywhere else than in the stomach, and they correspond, moreover, very closely in appearance to the curds which may be formed from cow's milk by the addition of rennet-pepsin and acid, heating the mixture to body temperature and, when the whole has coagulated, pressing the coagulum repeatedly together so as to thoroughly expel the whey. Such masses formed artificially no one certainly hesitates to call a curd, for when thus formed experimentally outside the body by the process above outlined the product differs in no essential particular from the early stages of the curd of ordinary commercial cheddar cheese. The conditions which are necessary for the formation of a cheesy milk curd, namely, rennet-pepsin, acid, warmth and pressure, may also be present in an infant's stomach, especially during those types of disturbed digestion which increase the amount of abnormal acids. The only real difference then between the factors in the commercial and physiological production of curds lies in the fact that while lactic acid is chiefly active in the commercial process, hydrochloric, butyric, acetic and other acids may also play a part in the stomach.

The curds formed from milk, although often spoken of as acid-paracasein curds, or loosely as "casein curds," because of the major part necessarily played in their formation by the coagulation and curding of casein, are not, however, composed exclusively of paracasein. In the formation of a cheese curd the fat of the milk is included in the meshes of the paracasein coagulum, and only a small part of this fat (less than 0.50 per cent.) escapes in the whey.

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* Des Kindes Ernährung, Erhährungsstörungen und Ernährungstherapie, s. 17; Sechste abteilung, zweite hälfte, 1906.

To understand the subsequent changes in these curds if formed in the stomach of the infant, it is therefore important to keep in mind that they are milk curds, including both fat and paracasein. If curding has taken place in small flakes these can be more or less thoroughly penetrated and affected by the proteolytic and fat-splitting ferments present in the stomach. But if large and compact these masses frequently cannot be disintegrated in the stomach, although it is possible that both fat and proteid may undergo some changes more especially upon the exposed surface. When not disintegrated in the stomach these masses, unless vomited, must in time be passed on into the intestines, where they are subjected to the further influences of an alkaline medium, the fat-splitting and saponifying agencies of the hepatic, pancreatic and intestinal secretions, and the destructive action of the varied bacterial flora there present. In the intestine, fats are split by ferments into glycerin and fatty acids, and the latter, in an alkaline medium, may be more or less transformed into soluble or insoluble soaps according to the nature of the bases with which they combine. When the proteid network is accessible it is subjected to digestive action, and bacteria which flourish upon proteid material may penetrate to some extent into its structure. Small soft flakes, if intestinal conditions are normal, may thus be readily disintegrated, while the larger masses may not be disintegrated, and may eventually appear in the stools.

Howland has recently advanced the view that the occurrence of such masses in the stools is an evidence of excessive fat in the infant's food. The formation of such curds in the stomach is not limited to cases receiving a high percentage of fat in their food, since observation directed to this point will show that they occur even with very considerable dilutions of plain milk, and the explanation of their occurrence in Howland's type of cases need not be a difficult one. Since high fat percentages frequently cause stomachic disturbances, accompanied by the production of excessive quantities of abnormal acids, the most favorable condition is present for the formation of large curds, namely, excessive acidity. Furthermore, the larger the amount of fat in the milk food, the larger the fat inclusion in the proteid coagulum, the larger the mass formed, and the less the probability that it can be disintegrated during its passage through the digestive tract, since the greater preponderance of fat will tend to weld it the more firmly together.

If further argument is needed to prove that the formation of these masses depends primarily upon the coagulation and curding of the paracasein, it may be found in the effect of efficient peptonization. Peptonization of milk which transforms such portions of the casein as its action reaches into soluble and non-coagulable forms of proteid is one of the best recognized of available methods for causing the disappearance of such masses from the stools. It should be remembered, however, that this result is not always attained because the partial peptonization so often employed may leave considerable casein unaltered and still capable of entering into the formation of large curds. Citrate of soda, lauded for this purpose by Wright, and certain alkalies may also be effective, the former by preventing the formation of paracasein and the latter by delaying curding and by neutralizing excessive and abnormal acidity. However, all these must be used in sufficient quantity.

Although the foregoing theoretical and clinical grounds for considering the masses found in the stools to be identical in origin with those found in vomited matter seemed reasonably conclusive, a series of observations and tests were instituted at the Nursery and Child's Hospital to definitely settle certain disputed points. Foremost among these was the claim that the masses in the stools contain no proteid, but only fatty acids and soaps.

Typical firm curds occurring in seventy-five stools passed by thirty-eight infants were subjected to qualitative chemical tests to determine the presence of proteids, soaps, fatty acids and neutral fat in these masses. In the tabulation of the results the tests upon the stools of older children who were receiving whole milk together with other diet consisting of eggs, cereals, etc., have, with the exception of two representative instances (numbers 25 and 26), been excluded in the belief that the findings among younger infants fed exclusively upon milk formulas would prove of greater interest. In the table as appended appear the tests upon masses found in fifty-one stools of twenty-six infants. The youngest were two months old. Ten were from two to six months old. Eleven from seven to thirteen months old. One fifteen months old and two three years old. The fat in the formulas varied from

2 per cent. to 4 per cent. In only five cases did it exceed 3 per cent. The proteid percentages ranged from 0.90 per cent. to 4 per cent. In but eight of these, however, did the proteid exceed 2.50 per cent., and the majority of these were older infants fed upon plain milk diluted with barley gruel. Few, if any, of the formulas seem open to criticism as excessive if fed to normal infants at the ages given.

The technique employed was as follows:—

(1) The masses to be tested were ground in a mortar and thoroughly treated with successive portions of ether and boiling alcohol to dissolve out the neutral fat and free fatty acids. These solvents were then evaporated and their residue examined microscopically for fatty acid crystals (often after recrystallizing from boiling alcohol) and also tested with osmic acid and Sudan III. for fat.

(2) The residue remaining after ether and alcohol extraction was then treated with 5 per cent. hydrochloric acid which would split the insoluble soaps into fatty acids and form chlorides of the bases, as well as remove any inorganic salts. The residue was then again treated thoroughly with boiling alcohol to remove any fatty acid thus formed and the remainder washed with ether, thoroughly dried and set aside for the proteid tests. The washings (alcoholic) were examined for fatty acids, the finding of which at this stage would indicate the presence of insoluble soaps in the original masses.

(3) The washed and dried residue was then in each instance subjected to each of four well-known tests for proteids. These were the Biuret, Lieberman's, Millon's and Adamkiewicz's tests.

Applying these qualitative methods to the firm masses or hard curds, these bodies were found to consist mainly of fatty acids and protein in varying amounts, although they showed uniformly the presence of neutral fat by the staining reactions. Insoluble soaps were often present but apparently in lesser amounts than is usually assumed, never appearing in these purely qualitative tests to approach in amount the fatty acid or the protein. In some of the curds the final residue considered to be protein was at least one-half of the original mass tested. In every instance without exception, the final residue of the masses responded to all four of the tests for protein. Bearing in mind that a possible source of error might lie in the presence of bacteria which might give the protein reactions, the masses were in thirty instances examined for bacteria by staining smears with aniline gentian violet, and in no instance were they found to be numerous. As a further and more important control the stool substance in which the masses were found was in every case subjected to exactly the same processes and tests and in no instance could the presence of protein be demonstrated. In order to ascertain whether soluble soaps were present in these masses and had been dissolved out by the first treatment with ether and boiling alcohol eleven hard curds from the stools of nine infants were examined for soluble soaps and in no case were they found.

The characteristic masses upon which this series of tests were made varied usually in size from that of a small pea to that of the last phalanx of the adult thumb. Their surface was usually smooth and their shape rounded or oval. In some cases they showed irregularities and indentations due to pressure against each other. They were often quite hard so that it took considerable force to cut them. At other times they were so soft that they could be smoothed out with very little pressure. The hardness depended upon the relative amount of proteid, soaps, fatty acids and neutral fat present. The softer ones consisted mainly of fatty acid or fat, while the harder masses contained a relatively greater amount of protein. In the typical hard curd the cut surface showed a structure resembling closely that of curds made artificially or of those vomited by infants. The masses containing considerable fatty acid were white, translucent, very soft and friable and easily obliterated by pressure, while those which contained protein chiefly were hard, opaque, of a yellowish white color upon the surface and could not be obliterated by moderate pressure. The masses rich in fat and fatty acids were often flattened and partially melted when seen in the fresh stool. These softer masses consisting largely of fatty acids and fat melted almost completely with moderate heat, while the masses richer in protein melted less completely and on increasing the heat had the appearance and odor of toasted cheese.

We would repeat that all of these masses responded to the tests for proteids no matter whether they were hard or soft and regardless of the presence of soaps, neutral fat or fatty acid. On the other hand the ordinary stool substance in which these masses were imbedded when subjected to the same procedure and tests did not give the protein reactions.

There are, however, certain other masses occurring in the stools of infants both those who are nursed, and those who are artificially fed which are made up practically of calcium soaps alone, but these masses can hardly be mistaken for true curds. They are quite small, rarely larger than .2 to .3 c.m. in diameter. They usually occur in green or greenish stools from which they are distinguishable by their gray color. They are very soft, can be flattened out by pressure, are not friable, and are a more homogeneous part of the stool mass than the true curd.

Two of the cases tabulated (Numbers 9 and 8) are of especial interest as bearing upon the origin of true curds. The first (Case 9) an infant of six months and weighing thirteen pounds, had been receiving without disturbance a split proteid formula: Fat, 3 per cent.; sugar, 6 per cent.; whey proteid, 0.90 per cent.; casein, 1.10 per cent., which was changed to an ordinary F 3.—S 6.—P 2. formula. Vomiting of curds ensued and hard rounded masses appeared in the stools consisting largely of protein. On resuming the split proteid formula the vomiting and the curds in the stools disappeared. The second case (Case 8) was almost identical, a change being made from: Fat, 3 per cent.; sugar, 6 per cent.; whey proteid, 0.90; casein, 0.70 per cent. to an ordinary F 3.—S 6.—P. 1.60 formula. In this case also vomiting and curds ceased on resuming the previous formula.

It therefore seems apparent that the observation of others that these typical masses contained considerable fatty acid, neutral fat and soaps has led to the hasty conclusion that the masses were simply aggregations of fat derivatives and not true curds. No confusion need, however, arise on this score if we draw upon our available knowledge concerning the curding of milk in the stomach and recall that by all analogies as well as by chemical tests of such curds whether when rejected from the stomach by vomiting or passed on through the intestine, such firm massive curds must primarily be "milk curds" whose origin depends upon the formation of acid paracasein and that the inclusion of fat is but an inevitable mechanical accident.

TABLE OF MATERIAL TESTED.

Name.	Age.	Formula.	Reaction of Stool with Litmus.	Protein.	Fatty Acid.	Neutral Fat.	Soaps.
1. D. F.	2 mos.	3 —6—1	acid	+	++	+	+
2. M. L.	2 "	2.50—6—1	"	++	++	+	+
3. A. W.	3 "	2.50—5—1	"	+++	+	+	+
4. E. H.	3½"	3 —6—1.50	"	+++	+	+	+
"	" "	"	"	+++	+	+	+
"	" "	"	"	+++	+	+	+
5. J. S.	4 "	2 —6—1.50	"	+	+	++	+
6. J. K.	5 "	2.50—5—1.50	"	+	++	+	—?
7. A. L.	6 "	2 —6—2 B. W.	"	++	+	+	+
8. C. O.	6 "	2.50—6—1.60	"	+	+	+	—?
9. J. E.	6 "	3 —6—2	"	++	+	+	+
"	" "	"	"	++	+	+	+
10. J. A.	6 "	3 —6—2	"	++	++	+	+
11. A. L.	7 "	2.50—6—2	"	++	+	+	+
12. T. K.	7 "	2 —6—.90	"	+	++	+	+
"	" "	"	"	+	++	+	+
13. J. S.	7 "	2.50—7—2	"	++	++	+	+
"	" "	"	"	++	++	+	—?
14. A. S.	8 "	2 —6—2 B. W.	"	++	++	+	+
15. H. H.	8 "	3 —6—3 B. W.	"	++	++	+	—?
"	" "	"	"	++	++	+	—?
16. M. H.	8 "	3 —6 { .90 whey proteid 1.10 casein }	"	+++	+	+	+
"	" "	"	"	+	++	+	—?
"	" "	"	"	++	+	+	+
17. W. R.	8 "	4 —7—3	"	++	++	+	—?
"	" "	"	"	++	++	+	+
18. A. T.	1 yr.	3 —6—3 B. W.	"	+++	+	+	+
"	" "	"	"	+	+++	+	—?
"	" "	"	"	+	+++	+	+
"	" "	"	"	+	++	+	++
19. J. A.	1 "	3.50—6—3.50 B. W.	"	+	+	+	+
20. M. C.	1 "	3.50—6—2.50	"	++	++	+	+
"	" "	"	"	++	++	+	+
21. O. L.	1 "	2 —6—2 B. W.	"	+	++	+	+
"	" "	"	"	+	++	+	+
"	" "	"	"	++	+	+	+
22. P. P.	1 "	3 —6—3 B. W.	"	++	+	+	+
"	" "	"	alkaline	+	+++	+	—?
"	" "	"	acid	++	+	+	+
"	" "	"	"	++	++	+	+
23. J. M.	13 mos.	3 —6—3 B. W.	"	+++	+	+	+
"	" "	"	"	+	+++	+	+
"	" "	"	"	+	+++	+	—?
24. J. W.	15 "	3 —4—3 B. W.	"	+++	+	+	+
25. B. F.	3 yrs.	whole milk, cereal, eggs, etc.	alka.	+	+++	+	+
"	" "	"	"	++	++	+	+
"	" "	"	acid	++	++	+	+
26. I. T.	3 "	whole milk, cereal, eggs, etc.	"	+++	+	+	+
"	" "	"	"	+	+++	+	+
"	" "	"	"	+	+++	+	+
"	" "	"	"	+	+++	+	+

In the above table the plus signs are to be interpreted as follows:—

+ slight amount.
++ moderate amount.
+++ large amount.

B. W. = Barley Water.

DISCUSSION.

ISAAC A. ABT, M.D., Chicago.—There is no more fertile field for investigation than the subject under discussion, particularly in view of the investigations made abroad. The results that have been reported from the Berlin school and the Breslau school, would lead us to believe that there is no such thing as proteid indigestion. The statement made by Czerny and Keller, in their most excellent treatise, goes on to say that if the chapter on the subject of digestion of food had been written ten years before they would have said that all disturbances were due to proteid indigestion, but now they feel that the trouble is entirely due to fats. They also say that the curds in the stool are not formed of proteid, but are a combination of fatty acids and alkalies to form soaps. I have fed babies that suffered from what I presumed was fat indigestion on absolutely fat-free milk and found in stools a curd that corresponds to the one Dr. Southworth has described. It is difficult to understand how a fat-free milk could produce a fat indigestion. I believe this line of investigation is of great importance.

JOHN LOVETT MORSE, M.D., Boston.—My assistant, Dr. Talbot, has been at work on this same subject and has gone into it even more elaborately than Dr. Southworth and his assistant, in that he has worked the thing out quantitatively as well as qualitatively. He has found that the basis of these large curds is in every case a proteid. He has also found that the amount of fat which is present in the curd varies almost exactly with the amount of fat in the food, showing that the fat is merely caught in the meshes of the curd. He has not only found this to be the fact in the curds in babies' stools, but has also found, as would be expected, that the same rule holds good in the artificial digestion of milks containing a varying amount of fat, viz., that the amount of fat in the curd varies with the amount of fat in the milk. His results as to the form of the fat, if I am not mistaken, are different from the results of Dr. Southworth. In the large curds the greater part of the fat was in the form of neutral fat. He has gone a little way into the investigation of the small curds; that is, those about the size of a shot, and has found so far that these curds are composed largely of soaps. The reaction of the stools, if I am not mistaken, depends upon the relation of the fat and proteid in the original food rather than on anything else. We had the same experience that Dr. Southworth did—that we sometimes got these large curds in babies that were taking barley-water mixtures.

S. McC. HAMILL, M.D., Philadelphia.—One year ago I had under my care Dr. Edsall's baby. He was suffering from a mild intestinal disturbance. We added a dextrinized gruel to his milk and within about three days the child began to pass curds which had very much the appearance of those which Dr. Southworth has described.

To determine what relationship the gruel might bear to the curd formation, Dr. Edsall undertook some laboratory experiments with the dextrinized foods. He applied varying amounts of HCl; first, to milk mixtures, and then to milk mixtures containing the gruel. The curd from the milk alone could be readily broken up, but that which resulted from the milk and gruel mixture was a gluey, indestructible mass. These results were so suggestive that we immediately cut out the dextrinized gruels and the curds promptly disappeared, from which we assumed that the laboratory experiment had been confirmed. We further assumed that there was some disturbance of the secreting property of the stomach. There are evidently conditions in which the gruels defeat the purpose for which they are administered, a fact which may throw some light upon this question of curd formation.

DR. NORTHRUP.—I should like to ask Dr. Hamill if the feedings were 5 per cent. alkaline?

DR. HAMILL.—Yes.

CHARLES G. KERLEY, M.D., New York.—Personally, I have used gruels in feeding for a long while, but by their use I have never been able in any one of these cases of proteid incapacity to give a higher percentage. I used them because of the additional nutrition furnished patients, but have not found that a higher proteid percentage could be given because of the introduction of the gruel into the food.

THOMAS S. SOUTHWORTH, M.D., New York (closing discussion).—I appreciate what Dr. Abt has said. I think it is largely due to the writings of Czerny and Keller that there has been this doubt as to the composition of the curd. It seems to me that it has been possible to disprove what the Germans have said, and I am glad to hear Dr. Morse say his own investigations have substantiated ours.

BLOOD MODIFICATIONS IN INFANTILE SCURVY.—Prosper Merklen and Leon Tixier (*Gazette des Hôpitaux*) made daily examinations of the blood formula in a case of infantile scurvy before and after antiscorbutic diet, and the use of iron. The blood formula showed constantly a diminution of hemoglobin, but the hypoglobulia, which is usually found, was not constant, and varied with the administration of the iron. After it had been taken for ten days, the formula was normal with regard to red blood cells, showing the value of the use of iron. There was a myeloid reaction shown by the presence of myelocytes, which occur with infections of some duration. The patient suffered from painful pseudoparalysis, and extreme anemia, but showed no hemorrhages.—*Medical Record.*

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AN INQUIRY INTO THE STATUS OF THE KINDERGARTEN.[*]

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Chicago.

INTRODUCTION.

It was in the hope of throwing some light on the medical aspects of the Kindergarten question that the investigation, of which this paper is a report, was instituted. This investigation was begun without prejudice either for or against the system and purely in a spirit of inquiry, with a view to obtaining information on some of the vital questions which the physician is called upon to decide in daily contact with his patients.

It may be stated at the outset that there is no intention of offering a final solution of the various questions involved. The opinions received from sources of equal authority are so diverse as to render a positive conclusion impossible. Indeed, as the subject is developed it will be noted the results obtained are in a sense disappointing. Yet I feel that the views expressed are of sufficient interest and importance to warrant the presentation of this paper, in which both the pros and cons of the question will be impartially stated.

It is beyond the scope of this paper to enter into a detailed discussion of the philosophy of Froebel. Yet, a résumé of the history of the Kindergarten will, I think, not be amiss.

SOME POINTS ON THE PHILOSOPHY OF FROEBEL.[†]

The kindergarten had its origin with Froebel (1782 to 1852), whose Philosophy of Education is based upon abstract thought. His philosophy is in essential agreement with the philosophical system known as Idealism, which formed such an important part in the intellectual life of the Germany of his day. The ideas of Kant, Fichte, Schelling and Hegel had impressed themselves on the thought of the times. When Froebel had arrived at the age of serious reflection, he was influenced by the philosophy of his predecessors. The philosophic spirit of Idealism, under the spell of which Froebel lived and breathed, attempted to unify the world and human life and its keynote was the grandeur and dignity of man.*

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[*] Read before the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 26, 1908.

[†] For this reference to Froebel's philosophy, I quote freely from a paper by John Angus MacVannel, Ph.D., Instructor in Education, Teachers' College Record, 1903.

Froebel did not present educational thought which was altogether new. Like all human progress, it was evolved from previous knowledge. The germs of Froebel's thought may be found among the ancient philosophers. Socrates, Plato and Aristotle speculated in a mystical way concerning the deeper problems of life. Similar speculations struggled through the Middle Ages and found vigorous exponents in Luther, Bacon and Comenius. Kant began a movement which thought to discover the unity of all life, of nature and humanity in the Absolute Spirit. Hegel developed this thought into a system. Froebel was directly influenced by the philosophic teachings of Rousseau and Pestalozzi. He sought the latter as his teacher and supplemented his doctrines by making all educational work all sided and universal.†

As Pestalozzi owed his inspiration directly to Rousseau, so Froebel, sitting at the feet of Pestalozzi at Ifferton, received the message from the lips and the work of his great master.

Froebel's strict adherents believe that education is no mere empirical matter, but has its warrant deep in the very nature of the world. But the unbiased reader will at times encounter in his writings conclusions that seem unwarranted, and important questions that are not satisfactorily answered. It cannot be permanently our purpose to accept Froebel's system without qualification, or at least more adequate interpretation in the light of results of later science and experience. It is at the same time all important that the fundamental truths of his thought shall be rationally preserved and that in the process of its worn-out forms its vital essence and spirit shall neither be lost, nor even for a time impaired. As Green, of Oxford, said of the system of Hegel, so may we say of the system of Froebel, "It will all have to be done over again." Yet, in this very process of transformation, the fundamental character of his thought will be more fully recognized and its permanence more completely assured. Commenting on the philosophy of Froebel, Oppenheim says:

"His methods rested upon a foundation of keen observation, of love, fellowship and sympathy. But he knew very little of the reasons outside of metaphysical considerations for his course of work. In addition, there was a certain amount of lazy thought, of mysticism in his belief. He set up a sort of glorified child worship."

No account of kindergarten instruction would approach completeness without a reference to the basic principle of Froebel's teaching, namely, a consideration of what he termed "gifts."

Froebel's presentation of the subject of Gifts appears extremely complicated.‡ The subject is a composite of mysticism, symbolism, mathematics, ethics and religion. The gifts were intended to serve a twofold purpose in the education of the child:—(1) to awaken his inner life to the perception of natural forces, and (2) to interpret the external world for him.

THE GIFTS.

The degree of isolation that obtains in the study of the gifts is directly due to the conception that they are materials of independent worth. The logical outcome of this isolation can be known through the study of kindergarten programmes and the actual demonstration of them in the kindergarten. It is the common practice in preparing an outline or programme to select a number of typical experiences from Froebel's "Mother Play," which are intended to initiate the child, through play, into his total environment. Correlated with these plays are songs, games and stories. The gifts are developed along independent lines in harmony with the prevailing notion, through long series of exercises that depend upon the logical sequence of form for their deepest significance.

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* MacVannel, Teachers College Record, November, 1903.

† "Law of Childhood," by W. N. Hailmann, 1889. Alice B. Stockham & Co.

‡ For the subject matter referring to kindergarten gifts, I quote freely from a paper by Harriet Melissa Mills, Teachers College Record, November, 1904.

The most notable effort in programme making and the one that has gained widest acceptance is the unpublished outline by Miss Susan Blow. The gifts in this outline are administered largely on the basis of form. They represent the subject-matter of exercises that in their initial steps concentrate upon some abstract notion inherent in the various gifts. In an address before the International Kindergarten Union, Miss Blow said: "The material used by the children for their productions has a geometric basis. Spheres, cubes, cylinders, squares, oblongs, triangles—indeed most geometric planes, and many geometric solids, thus become familiar to the little workers. Using them, the child comes to perceive them in all the objects around him. Numerical relations are also suggested, and thus is put into the little hands the mathematical key which unlocks the gates of inorganic nature."

Turning now to the prevailing practices in the kindergarten, a striking illustration is afforded of what it means to follow the lines of least resistance in the Froebel philosophy. The decision having once been made that the child has urgent need to know the formal aspects of material things, the next step is to supply this need through the use of gifts. This the Kindergartner may do by preparing her own series of exercises, or she may turn to the Gift Book or various manuals, and find the exercises ready to hand that will unlock to the child the "whole wide world of form and its elements of faces, corners and edges." Or, easier still, she may adopt outright a programme that must, because formulated by someone of large experience and insight, contain all the elements that child nature can need.

The formal programme also affords opportunities for building life forms; and naming the object and its uses becomes the subject of interesting conversation. For example, in an exercise with the fifth gift, the child builds a boat with cubes and triangular forms. The object is interesting because it touches life; but the practice of leading the child to a condition of awareness of the form built as a boat trapezoid crowds the exercise out of the range of the childish comprehension.

One of the fundamental characteristics of the fourth gift is contrast in dimension—length, breadth, height. These elements of dimension are permanently embodied in each of the eight bricks into which the cube is divided, and are made the point of departure for an indefinite variety of exercises that emphasize the relative position of the bricks as they are built into the three classes of exercises known as life, beauty and knowledge forms. These exercises may at the same time concentrate upon any one of the following ideas as the principal aim of the lesson, viz., divisions of the cube, enclosure of space, extension plays, surface movements, forms illustrating the laws of balance, illustrative lessons and geometric forms, of which there are at least thirty-two examples of square and oblong prisms. Each gift has its own peculiar principles and laws to be demonstrated through play exercises, and these—known only to the teacher—constitute the almost endless resources of the kindergarten gifts.

In kindergartens where the logical geometric sequence of the gifts is held inviolate, the children play through exercises that emphasize sphere, cube, cylinder, square and oblong. They count faces, corners and edges, first on the gifts and then on the objects around them.

They discover vertical, horizontal and oblique lines, angles and triangles of every description, while prisms—square, triangular, rhomboidal, trapezoidal, etc., are made to develop in logical progression; and the road to discovery is so hedged about with limitations and restrictions that no element of chance enters to prevent the prearranged achievements. For example, in developing the right angle two sticks are given to the child, and the impulsive response results in the perfectly natural discovery of the right angle. This procedure has been defined as the "method of restricted freedom."

It is a well-known fact that Froebel did not complete the series of gifts as they are used at the present time. He left many vague hints concerning the extension of the gifts by the addition of new forms—and subsequently of more sub-divisions—that would render the series more complete in its evolution of form, and further elucidate the fundamental properties of matter, time and space. There has been a persistent effort on the part of his followers to realize these suggestions, with varying success.

It is needless to say that as time has gone on the general adherence to the strict Froebelian teaching has relaxed, and while in some quarters there remains a semblance of orthodoxy, nevertheless, in the more enlightened quarters the interpretation is very liberal, and it would seem, almost at a glance, that the strict observances laid down by the founder must come to be regarded as obsolete because they are antiquated and not in accord with any definite knowledge of the brain perceptions of the child. The modern kindergartens, under the most enlightened leaders, tend to abandon the formal methods and programme and consider "that, after all, the child remains the heart and the inspiration of it all."

MANNER AND LIMITATIONS OF THE INVESTIGATION.

The investigation of kindergartens, from the physician's point of view, was suggested to me as a result of numerous conversations which I had with medical men concerning this subject. Some thoughtful colleagues were in the habit of advising parents most strenuously against sending children to kindergarten. Many of the reasons physicians gave for taking this position will appear in the subject matter which follows. I undertook the investigation in the hope of obtaining authoritative opinions. I myself could not arrive at any definite decision, nor was any conclusive information to be found in the medical literature. It seemed to me that in order to make the investigation far-reaching enough, it would be necessary to receive information from various sources. I therefore sent questionnaires to physicians located in various parts of the country. Opinions from those in leading positions in pediatrics and neurology were solicited. A similar blank was sent to educators. A different form of question blank was sent to kindergarten teachers and instructors in kindergarten colleges.

I wish that I might here give full credit to all those who replied to my inquiries, but space and time forbid, and I take this opportunity of extending my thanks to all who replied, assuring them of my appreciation of their co-operation, without which the preparation of this paper would have been impossible.

In presenting the summary of opinions I have received from my correspondents, I have deemed it advisable to do so, first by discussing the answers to each question separately, and second by giving the deductions that may be drawn from the answers.

In order to make a further estimate as to the influence of the kindergarten instruction on the mental and physical status of the child, other blank forms were addressed to first grade teachers and mothers who themselves had had children in the kindergarten. It is obvious that such a plan of investigation as I have followed is not without numerous limitations. It is not easy to frame questions that will elicit definite answers, nor is it easy to frame the answers in such a concise way as to convey in a few brief words the best of one's thought or experience; and it is clear from the very nature of things that the individual answer must have a fluctuating value. A partisan kindergartner, or a first-grade teacher who is a devotee to this form of teaching, will resent at once any implication that the kindergarten is anything but perfect. We learn, too, that the kindergarten conditions (perhaps this is no more true of kindergartens than other educational institutions) lack in uniformity. The differences in the institutions would explain in many cases the variety of answers received and would undoubtedly influence, to a large degree, the formation of opinions. Not only do the methods of instruction vary within wide limits, but, as one would expect, the teachers also vary greatly in ability and natural fitness. The children, too, are influenced by home conditions. The children of nervous parents, though coming from comfortable homes, present a problem somewhat different from children who come from uncomfortable quarters, where the advantages of culture and good example have been denied them.

PHYSICIANS' ANSWERS.

The physician is often consulted by parents as to whether a child should be sent to the kindergarten, and if so, at what age and what conditions would demand a discontinuance of attendance. He is appealed to for advice so often in connection with this subject that he naturally would have possessed himself of information which could be of value to his patients. The questions asked were mostly medical in character, but the replies received show that my correspondents had evidently given the subject much thought.

The first question asked was: "Do you commonly advise parents to send physically normal children to kindergarten?" The second question: "Are you opposed to sending physically normal children to kindergarten?" is so closely related to the first that the replies received to both questions may be considered together. Most of the replies were favorable; not a few were unfavorable and a few were indifferent; that is, the writer qualified his reply in such a manner that the answer was both favorable and unfavorable. So much depends on the child, the home environments and the kindergarten that kindergarten instruction may be valuable or harmful, depending on the provisions made. Therefore, these replies may be disregarded so far as drawing conclusions is concerned.

Those who are opposed to the kindergarten believe in the superior value of an outdoor life and unrestrained play; they deprecate the absence of ventilation in the kindergarten quarters, the complexity of the curriculum, too much play, the association of precocious, vicious and diseased children with normal children, the lack of competent teachers, the early age at which children are sent to the kindergarten, overstimulation and exhaustion of nerve centers and interference with the normal physical development, unnecessary exposure to infection, too much eye work. The following answers are characteristic of this group.

"I don't believe in kindergartens in cases where children have good homes; the best kindergartening may be obtained in the open air; there is too much eye work in the kindergarten and physical deformities such as scoliosis may develop."

Another correspondent writes: "Show me the child reared of sensible parents who look after the welfare of their offspring themselves, who treat their child as though it were a human being, confide in it, and it in turn, in them, who instill into that young mind seeds of common sense, self-dependence, righteousness, leaving out false modesty and deceit, who depend upon outdoor air, proper food and a quiet brain as a means of education, until this child is seven or eight years of age, old enough to attend the lowest class of the primary department of a decent school —show me such a child and I'll match him or her in health or disease against any conservatory raised, kindergarten, walked when-he-was-eight-months old, malnutritioned, myopic prodigy that ever drew the breath of life."

Another correspondent says: "I am opposed to the kindergarten because of the crowded schoolroom and the too early discipline and because the time should be spent in the open air. I think that the kindergarten is an abomination and born of a delusional belief that it is possible to make great men of little brains if begun immediately after birth."

Another physician expresses himself as opposed to the kindergarten because the normal child develops rapidly enough at home and does not need the extra or overstimulation of the kindergarten. Home training is better when done by a competent mother. There are, however, a few children of sluggish, semistupid condition to whom kindergarten work is of benefit, but for the majority it is harmful.

More than one physician referred to the fact that the teaching was not always what it should be, and that the teacher herself is often nervous or is too much impressed with a serious duty and is not simple and quiet with her pupils. In many of the replies from those who are unfavorable to the kindergarten, the position is taken that the responsibility of the mother is shifted to the kindergartner, and in a large number of cases the latter is an unsuitable substitute. Many physicians believe that the children learn nothing of importance at the kindergarten and that any attempt at early education of young children should be discouraged. As one correspondent says: "Babies ought not to be found in the kindergarten, but in the home." Or, as stated by another: "In good home training, the child gets the best instruction in a natural way without overstimulation. Kindergartens vary very much, but in my experience most of them have a very narrow point of view."

In contradistinction to these unfavorable opinions, several take a middle ground, as is expressed by the following:—

"So much depends upon the child, teacher, physical conditions in the school, and last, but by no means least, upon the mother, that it seems to me it would require close attention to many cases before any generalization should be attempted."

In the favorable answers, there is again brought forcibly to our attention the fact that three factors must be considered—the child, the home and the teacher. The correspondents agree that the points in favor of the kindergarten are that it teaches the child to observe in a logical, profitable way, it inculcates habits of discipline and obedience, observation, thought; it imparts a training that cannot be received at home, as a rule affords opportunity of social contact with children of like age, teaches self-control, makes the child democratic, independent, purposeful (especially in the case of backward children), gives them new ideas, makes them creative, encourages mental and physical development and is a logical link between the home and the school, which is in marked contrast to those who believe the kindergarten to be a haven or place of refuge for those children whose mothers are anxious to be freed of the care and worry of looking after them all day. Of course, it is presupposed that the methods of kindergarten instruction are carried out properly and that the child is given the training which the average American mother, with her nervous irritability, is not in a position to give. Excluding physical disabilities or congenital diseases, these correspondents are very much in favor of kindergarten instruction.

For instance, one correspondent summarizes his views as follows:—

"As systematic occupation for young children, the kindergarten fills a practical and decided need. When this purpose is frankly recognized and is not glorified into a cult and surrounded with mystic symbolism, there results a simple and useful combination of play and learning which appeals to children and gives them a better sense of rythmic and coöperative play than they get in smaller groups. It is only when the very simple purpose of this type of occupation is overlooked and the whole made subservient to principles and methods that rest on immature theories, that the kindergarten cult arises. This seems to me subject to abuse and to react unfavorably on children and teacher alike. Making due allowance for this form of exaggerated system-burdened procedure, and the equally crude insistence on a symbolism in occupations that carry their own interest and meaning with them, I cannot see that our use of this aid to early education has been particularly misguiding. The evil I call attention to has been generally recognized and the movement has come back from its period of exaggerated importance to a fairly well-defined and useful status in primary education."

Another correspondent says: "I have been an advocate of kindergarten training for many years, but I have been opposed to some of the abuses of the kindergarten, to its excessive symbolism, and to the preservation of some of the cruder forms in which Froebel expressed his principles. Better understanding of child nature, with the help of child psychology and physiology has improved much of the kindergarten material and kindergarten methods; but it has not touched the fundamental principles; in fact, the kindergarten idea, with its appreciation of the play instinct, of manual work and of objective and creative methods of teaching, is destined to pervade the curriculum of the entire elementary school."

Yet another correspondent expresses himself in this manner: "In brief, I might say that I believe in kindergartens for normal children, but that even here one should be careful not to push them very much mentally, and to watch particularly the effect on nervous children. Many of them are, I think, overstimulated by any kind of schooling. However, of all kinds of schooling, it seems to me the kindergarten is the best, since it attempts to make children think and observe rather than to crowd them with merely memorized data. With regard to children who are delicate physically, I think the matter is such an individual one that I hardly know how to answer it. One must balance the disadvantage of confinement with other children against the possible loneliness at home, and the absence of the association with children, which is often so beneficial. I am a decided believer in children associating early with others, in order to avoid the development of peculiarities which the petted 'only' child is likely to develop."

The next question asked was: "Should the so-called nervous children be sent to kindergarten?"

The opinions of the correspondents varied somewhat, some of them believing that the kindergarten often benefits some nervous children; others, that it is positively harmful, and still others taking the ground that if the kindergarten is under medical supervision it is of benefit to the nervous child, otherwise not.

It is desirable that these children should be kept occupied, and attendance at a kindergarten removes them for several hours a day from such home influence as may contribute to their nervous condition. Most nervous children stand in need of some kind of regulation away from home and friends. Of course, each individual case must be studied by itself, and if harm is being done the child should at once be removed from the kindergarten. By far the majority of the correspondents prefer not to send the nervous child to kindergarten. They say that there is too much competition; the child is under tension; the work is exciting; the restraint is injurious; the teachers do not understand the proper care of such children. On the other hand, those who are in favor of the kindergarten for these children believe that association with other children, discipline, occupation, training, direction of energies, are of benefit. One correspondent called attention to the fact that the so-called nervous child should not exist in the physician's mind and that analysis of the nervousness will reveal the inherent environmental vices, which are to be considered in the plans for the management of a nervous child.

Questions 5, 11 and 12 are so closely related that the answers may be considered together. They refer to the influence of the kindergarten on the physical development of the child; whether delicate children should be sent to kindergarten and whether the physical development of the child is retarded or improved by the kindergarten.

Some of the correspondents were of the opinion that the effect is a favorable one, because of the regular hours, systematic work and the influence of the teacher. Retarded children need special teachers, and, too, they are bad associates for other children. Outdoor life, unrestrained play, absence of overtraining, are important factors in regulating properly the growth of any child. Therefore, delicate children should be excluded from kindergarten, especially in winter when contagious diseases are prevalent. The kindergarten it would seem is valuable in physical development in most cases, and the sensible kindergartner will treat the pupils as individuals.

A very important question, in my opinion, is the following: "Have you in your practice encountered unfavorable effects on the nervous or mental states of children from kindergarten attendance?" While the correspondents gave many valuable opinions, I fear that in most instances they were based on isolated cases. Therefore, we find that they believe that nervousness is increased; that nervous children do not do well, being rendered more nervous and excitable; it makes them restless at night; they acquire habit spasm, and several have noted cases of chorea in nervous children as the result of kindergarten attendance. Very much depends upon the qualifications of the teacher to manage the nervous child. Headache, anemia, anorexia, downheartedness, low-spiritedness, hysteria, imitation chorea and an exaggerated self-consciousness are other conditions that were noted. A prominent New York neurologist believes that the kindergarten is a fairly useful institution when carefully conducted. He does not think that it does very much good or very much harm, and that one of its virtues is to give the mother a rest by taking the child from home.

The last question asked of physicians was, "Have you observed that children who attend kindergarten are more frequently, or at an earlier age, attacked by acute exanthematous or infectious diseases (including pneumonia and tuberculosis) than those who do not attend?"

One physician is of the opinion that there are more contagious diseases among the kindergarten children because their resistance is lowered by lack of physical exercise and fresh air. Others believe that the close association of so many young children, coming from all walks in life, tends to increase the danger of infection. On the other hand, a medical inspector does not consider the kindergarten a factor in the spread of contagious diseases; in fact, he says that any contagion would be more quickly recognized there than it would have been at home.

EDUCATORS.

The same blank forwarded to physicians was sent to prominent educators, but special questions on this blank were referred to them. Most of these correspondents believe in the value of the kindergarten, especially for the children of foreigners, and because it supplements home training and develops perception and imagination. The main thing, however, is the knowledge and good sense of the kindergartner. One man stated very emphatically that he considers the kindergarten the best educational feature of to-day. Another regards it as the best link between home and school, affecting favorably not only the physical development of the child, but also its mentality, making it less self-centred, less nervous, less likely to breed bad habits. Others say that the kindergarten opens the universe to the child in a systematic way and is productive of healthful development. Kindergarten instruction at home is good, but it is more likely to deprive the child of culture of association, which, on the whole, is valuable. It also makes better pupils in the grades because of the early training. Those who are opposed to the kindergarten believe that there is not enough freedom in it; that the children are kept in a constant state of tension and over-stimulation; the too frequent change of occupation; the young age at which children are sent to it. On the other hand, says one correspondent, a thoroughly good kindergarten, which really carries out Froebel's ideas of self-development and does not keep the child in such a high state of tension and constant occupation that he wants to be entertained all the rest of his waking hours, is most excellent training for school work.

As to the age at which children should be sent to kindergarten, the majority of those who answered this question qualify their answers with so many restrictions and provisions as to make it evident that the question cannot be answered positively, either yes or no. It is apparent that the degree of nervousness of the child, the regulation of the kindergarten, and the ability of the teacher to handle children will determine at what age kindergarten instruction should be begun.

As to the effect of the kindergarten on the physical development of the child, these correspondents nearly all subscribe to its value. It tends to develop the child, and only in very rare instances has it an opposite effect.

KINDERGARTEN TEACHERS.

Eleven questions were asked of each of the kindergarten teachers to whom the blanks were sent. The correspondents were selected with care, so that the answers received naturally would carry weight in coming to the formulation of conclusions.

Question 1. What proportion of children constituting your annual roster of pupils remain in your classes throughout the year?

The majority of these correspondents find that about two-thirds of the class remains in attendance throughout the year. Only one teacher gave a figure as low as one-half, and two gave figures as high as 90 per cent. The main reasons for a falling off in attendance are those caused by inclement weather or the fact that the children of well-to-do people leave the city during the severe winter months, spending them in warmer climates. It is very evident that the civic status of the child has much to do with attendance at the kindergarten.

There does not appear to be anything connected with the kindergarten itself, its work or its administration, which is operative in reducing the attendance.

Question 2. If there is an actual falling off in attendance, is it due to one of the following causes? (*a*) Contagious diseases; (*b*) nervousness; (*c*) failure of physical health; (*d*) acquired defects of sight, hearing or speech.

The nature of the answers to this question naturally would be dependent very largely on the relation existing between the teacher and the child's parents, because otherwise the reason for non-attendance would be unknown. Furthermore, kindergarten teachers, as a rule, easily lose track of the children because attendance on the kindergarten is voluntary. The child may drop out of the work altogether, the cause for this being unknown. The answers received to (*a*) show that contagious diseases are by far the most frequent cause for absence, particularly during those months of the year when these diseases are most prevalent. Nervousness, on the other hand, does not appear to be a considerable factor, and then only in the case of children who naturally are nervous or whose home life predisposes to nervousness. But what is of great importance in this connection is the fact that the work of the kindergarten, in the minds of my correspondents, does not tend to cause nervousness in healthy children. The same is true of (*c*)—failure of physical health—as a cause of absence. None of the correspondents noted any defects of sight, speech or hearing, although the answers to this question might have been somewhat different if these children were given the benefit of a medical examination.

Question 3. What, from your experience, would you consider to be the most eligible age for entrance to the kindergarten?

Many of the correspondents are in favor of four years as being the most eligible age for entrance. Only one teacher thinks that six years is the proper age, and those favoring ages from three to four years are very few in number. The answers to this question show that from four to five years is the selective age when the child should be sent to the kindergarten. Some of the correspondents pointed out very aptly some of the features that enter into a discussion of this question, such as the number of teachers in the school, the physical condition of the child and its social environment. Some children had better be removed from home influences as soon as possible because of their pernicious effect on the mentality of the child, and some children are precocious so that they can enter the kindergarten at an early age. However, in the case of the normal child of good parentage, living in good surroundings, four years appears to be the earliest age at which kindergarten work should be begun.

Question 4. Has it been your experience that certain methods or particular kinds of applied kindergarten instruction produce (*a*) nervousness, restlessness or irritability; (*b*) disturbances of sight; (*c*) apparent loss of weight; (*d*) pallor; (*e*) bodily fatigue, and (*f*) decline in general health?

The answers to this question tend to show that kindergarten work does not produce the conditions named unless the work is too fine, such as sewing and delicate weaving, the instruction periods too long, the surroundings unhygienic, and the teacher too exacting; these conditions are operative not only in the kindergarten, but elsewhere, in the higher schools.

Question 5. Is the kindergarten more adapted to the needs of the children of the poor than to the children of the wealthy?

The majority of the answers to this question were in the negative, the correspondents being of the opinion that the kindergarten is equally well adapted to the needs of both the children of the poor and of the wealthy. One correspondent stated the matter very aptly when she said, "Both classes need the principles for which the kindergarten stands; but since the children of the poor receive less in the way of such an education at home than do the children of the wealthy, they naturally gain a richer experience." The principles on which the kindergarten is based apply to all, and cannot fail to profit all. Its teachings are beneficial to all children when efficiently and intelligently carried out.

Question 6. From your experience as a teacher, can you suggest any class of children to whom the kindergarten is positively harmful?

Unless the child is excessively nervous, or mentally defective, no harmful effect is caused by kindergarten work. All the correspondents were agreed on this, as might be expected.

Question 7. Can you suggest any particular class of children to whom the kindergarten is of unusual value?

It must be apparent to all that certain classes of children would be benefited more by this work than others, and while a few kindergartners are of the opinion that all children are equally benefited, the majority of them believe that benefit accrues particularly to the only child, the restless, capricious child, the neglected child of the rich, selfish children and those lacking proper care at home; backward, shy children; children who are slightly deficient mentally, but not enough to be prohibited from engaging in the kindergarten exercises, and especially the children of foreigners.

Question 8. Can you point out any kindergarten methods which are in general use or practice in isolated cases that you consider directly harmful?

The answers to this question proved conclusively that there are good and bad kindergartens; that the good ones are potent factors for good and that the bad ones ought to be abolished—the sooner, the better. Baneful influences are very fine handwork; long periods devoted to such work; too many subjects in the curriculum; too much specialization; too many teachers; too much "showing off" of the children at exercises for the benefit of visitors; too many normal school students observing the children at one time; too much hurry and bustle; too closely following a set programme, and too little play. It was also pointed out by one correspondent (and I wish to emphasize her answer) that often the harmful effect of the kindergarten on a certain child is overlooked because the observer mistakes excitement for interest. Another correspondent stated that "there is not enough gardening, outdoor work and play in the curriculum; that the fine drill of every kind should be displaced by plays and quiet occupations, demanding large, free movements, such as building with large blocks, modelling in clay, drawing with large crayons on large boards or papers, and such other occupations as are suitable for children of from three to five years of age. For the older children, more difficult tasks may be prescribed, such as making things from thin cardboard, or wood, or cloth; such as little wagons, boats, houses, shops and so forth. It is all great fun, quiet, and demands manual work and a wholesome, because spontaneous, quality of attention."

Question 9. From your own knowledge, are the schoolrooms used for kindergarten purposes suitable, so far as lighting, heating and ventilation are concerned?

It is apparent that each teacher answered this question in accordance with the location of her particular kindergarten. Those who are housed in suitable quarters, answered "yes"; the others answered "no." That there is room for improvement in this direction, we all know, because unfortunately many kindergartens are placed in the basement where they are out of the way and because the authorities feel that it is far more important to house the older children in the school suitably than to look after the kindergartens, where the children are in attendance for only a few hours during the day. We must insist upon proper hygienic surroundings for these children, even though their hours are short, because it is here that an impress—a most undesirable one—may be made on the child's physical health, from which recovery is not only protracted but may be impossible.

Question 10. Is it your observation that kindergarten pupils are too closely confined indoors?

Nearly all the answers are in the negative, probably because of the same reasons referred to in the comment on Question 9, and there are comparatively few kindergartens in which the pupils are not given a recess and in which outdoor exercises and work are not a part of the curriculum.

Question 11. State briefly what, in your opinion, are the best reasons for sending children to kindergarten?

The correspondents consider the kindergarten the best preparation for the work of the primary grades, for inculcating habits of concentration and industry, attention, respect for laws and an appreciation of individual responsibility. It places the child in its normal relationship with other children, teaches co-operation, is an entrance into an ideal community and a good preparation for the life-work. The child needs the child; it needs to have the joy of companionship and the incentives which come from imitation and suggestion; it needs to learn to subordinate self.

FIRST GRADE TEACHERS.

The questions asked of the first grade teachers had reference to the comparative value of training; that is, whether the children who have had kindergarten instruction make better progress in the first grade than those who have not had such instruction;

which of these two classes are most amenable to discipline and whether the former are more delicate or more nervous than the latter.

The answers to these questions indicate that, on the whole, the first grade teacher is rather inclined to look with ill favor on the kindergarten, except that the majority of my correspondents agree that the child that has attended kindergarten makes better progress than does the one who has not. The discipline in the grade school is more rigid than that in the kindergarten, and often it is difficult for the child to place itself unreservedly under the sway of the changed conditions. The kindergarten discipline, it seems, does not, in most instances, demand such strict obedience as does the school discipline. A few of my correspondents were of the opinion that the kindergarten children are more nervous than others, and one teacher stated that she would rather have children who have not attended a kindergarten. Another said that while the kindergarten children are more disorderly at first, they soon fall into the routine of first grade work.

It seems almost impossible to make any deduction from the views which I have obtained from primary teachers. While some believe that the children are more nervous and less amenable to the discipline of the school, others believe the children are more alert and receptive, and all in all make better pupils. The same diversity of opinion which confronts one throughout the entire inquiry occurs in summarizing the views of the first grade teachers and it is evident that it is difficult to make generalizations.

A few answers are so significant in this connection that I reproduce them in great part. "The kindergarten renders them adaptable to first grade work; but there is a great deal of namby-pamby, mushy control in kindergartens, with the idea of allowing children to do as they please." "I consider that children as a class who have attended kindergarten are more ready for school work and can make better progress than those who have not. They have been taught to act quickly in obedience to suggestions from the teacher and in unity with others, one of the most important lessons to be conquered early in school life." "They have been started in a systematic training of ear, eye and hand, which is a foundation for all the purely mental work of the schoolroom, as well as the construction and manual training work. Added to this, they have songs and rythm work, which are not only of value in an artistic way, but tend to promote good habits in breathing and bodily movement. Some time ago, when kindergartens were in their infancy, the correspondent thought that on account of the freedom and the play-spirit encouraged, the children were not as amenable to discipline after they had attended a kindergarten as when they came straight from home. Now she feels this is entirely changed, the play-spirit is so entirely hidden behind a constant occupation, along lines of interest to the child, that the work is all play and the play is all work. It is her belief that children who have attended kindergarten are less delicate and nervous than those who remain at home up to the time of entering the first grade. Children love companionship and thrive under it; and as they must have occupation, the constant variety of their work keeps them from growing weary of it and restless under it. But much could be desired for all schoolrooms in better ventilation, much more fresh air and cleanliness." "The temperament of the child, the character of the kindergarten, the qualifications of the kindergarten teacher would tend largely to determine the answers."

The following question was asked of mothers:—

"Please state in a general way your impressions as to the merits or demerits of the kindergarten as you have observed them in your own child."

Naturally, most mothers would make careful inquiry before choosing a kindergarten for their children, so that the mother's opinion as to the value of kindergarten teaching is of considerable worth in arriving at conclusions on this subject. Strange to say, however, quite a few of the answers received from mothers were unfavorable to the kindergarten. Perhaps this is the result of an error in selection on the part of the mother, or the fault of the child, or perhaps the system is wrong. Some of the mothers are of the opinion that if the mother will look after her child, giving it the advantage of a mother's care and guidance, the kindergarten is superfluous. One mother stated that for the mother who simply cannot train and raise her own children, and does not know what to do for or with them, the kindergarten is a godsend, both for the mother and child. Another mother found that her child derived the greatest benefit from applying the best of kindergarten methods and training to every-day life, without imposing restrictions, or sapping or over-stimulating the energies in the kindergarten. Others objected to the poor ventilation, the size of the classes, exposure to contagion, loss of sunshine, the development of a craving for amusement, making parrots of children, robbing them of fresh air, over-stimulating them mentally, and teaching them to play in school rather than to study. In my opinion, the following answers the question best: "Very beneficial when the kindergarten is of the highest standard, conducted in a large, well-lighted and well-ventilated room, and in charge of a woman who has made a thorough study of child nature. Under above-mentioned conditions, my child has shown a tendency to grow more systematic, more independent, and less self-centred. Under no circumstances however would I send my children to kindergarten unless there was one fulfilling all of the above-mentioned conditions within walking distance of the home, for I found that one week's attendance at a kindergarten of the type so common in most neighborhoods was very wearing, tiring the child physically and mentally, so that at the end of the session he would be too tired to eat the noonday meal and too cross to enjoy the play which before he had entered into with vigor and interest."

The favorable answers are equally characteristic. These mothers found that the child is taught unselfishness, given more wholesome thought and employment, bringing out its individuality and making it light-hearted and independent. At the same time, the child is given a pleasant occupation and good companionship. Emphasis is placed on the necessity of a trained teacher and proper surroundings, the home being the place where the balancing of effects is done. One mother said she had heard that children from the kindergarten do not make good pupils and that they expect to be amused and do not do things for themselves. She thought that this probably was the result of poor teaching. Most of these mothers are very loud in their praises of the kindergarten because they have found that it does so much to develop their children, not only mentally but physically; nervous, timid and excitable children becoming robust and happy. They believe in the kindergarten as a method of training the senses, inculcating the habit of obedience, cultivating powers of observation and developing the ability to mingle with other children at a time of life when they are inclined to be shy and awkward. Although kindergarten teaching has its drawbacks, say the mothers, the advantages far outweigh them. The kindergarten cannot be a substitute for home training, but it is often a safe refuge for little ones whose parents are obliged to be absent from their homes a part of the day, and therefore are unable personally to direct the steps of the child rightly. The child learns to respect the rights of others, to think of himself in relation to others and to develop a sort of community spirit. On the whole, these mothers believe that the kindergarten is a good institution and that it should be supported.

To pronounce the final word on this complex mass of evidence, and to reconcile the various conflicting opinions is obviously impossible. The proponents of the kindergarten system will find nothing to decrease their enthusiasm and the opponents to the system will feel all the more justified in their opposition. Yet, I believe, certain non-partisan deductions are clearly indicated.

In order to approach the subject with a better understanding, one must recall the origin of the kindergarten. Planted and reared in a soil rich in abstract philosophy, mysticism and symbolism, it developed into a growth foreign to our modern day concepts; and as a matter of course, the original Froebelian system is not in accord with our more recent knowledge of the functions of the child's mind and our acceptance of the modern scientific child study methods. To this end, a process of gradual simplification and the abandonment of obsolete forms has been necessary, lest the real meaning to the teacher and the value to the child be lost. Granted that the kindergarten conforms with the accepted child-study methods, the consensus of authority would indicate that children in general are not harmed by attendance. They may, however, be sent before they are of the proper age, which, in my judgment, is five years. Poor and neglected children are obviously benefited by the kindergarten. On the other hand, such children as have good homes, sensible, placid mothers, willing to devote time and care to their training, do not require the kindergarten. It is a question whether the kindergarten is the best place for the nervous and sensitive child. I would rather incline to the belief that brain rest is conducive to healthy brain growth, though even so one must modify that belief when the mother is believed to be incompetent or the home conditions unsuitable.

We have all met with that class of children who are nervous because of hereditary and environmental vices, and who do poorly in the home and poorly in the kindergarten. Such children would properly belong in school sanatoria equipped with specially trained teachers and located in the forest remote from the disturbing influences of city and town. Such sanatoria are being established in many parts of Germany.

The danger of contagion at kindergarten is a real one. It is my own experience, as it must be of everyone who comes in contact with children, that the kindergarten is a distributing point for the acute exanthemata and diphtheria; perhaps no more so than the primary grades, but certainly the infection within the kindergarten occurs at an age in the child's life when infectious diseases are least desirable.

A word may be said in passing with reference to the hygiene of kindergarten rooms. Many of them are overcrowded and are ill-adapted to the purpose; not a few are improperly heated and ventilated, and judging from many complaints made by mothers, some are untidy. In view of these facts, no issue can be taken with those who believe that the child should be in the open air as much as possible.

While it is true, as has been so frequently emphasized throughout the report, that the kindergarten offers opportunity for social contact with children of like age and gives the child occupation, yet many mothers comment on the fact that their children became more restless and were more difficult to entertain at home after kindergarten attendance. The little ones desired frequent change of amusement and lacked initiative.

It is impossible, from the answers received, to decide whether kindergarten children make better progress and are more amenable to discipline in the first grades. After mature consideration, I have come to the conclusion that the usefulness of kindergarten instruction does not lie in the fact that it increases mental activity, and I am satisfied that a child gains no intellectual advantage in later life because it has attended kindergarten—for the same reason it suffers no disadvantage because it has not attended kindergarten.

Briefly, the kindergarten training initiates the child into school life through the medium of playful occupation, which initiation would occur in another form later on in the curriculum. The kindergarten has its place. It is not necessary to all children; it is unsuitable for some.

Perhaps no more important, yet on the other hand more delicate topic can be considered than the qualifications of the teacher herself. It is not sufficient to say that not every woman is fit to be a kindergartner. It would be more correct to state that the fewest are fit to be kindergartners. Many of the evils of the kindergarten may be eliminated by a competent teacher. A capable kindergartner does not permit the children to be over-stimulated. She recognizes the capacity of her charges. She does not allow them to become fatigued because she realizes the physical endurance of the individual and the class. She does not keep them indoors when they ought to be out-of-doors. And more than all else, she is not enslaved by the symbolism of gifts and obsolete methods. An efficient kindergartner will lead a child by simple play.

In the final analysis, we are forced to the conclusion, as indeed one cannot fail to have been throughout the discussion, that each child must be considered as an individual. In other words, the desirability of the kindergarten depends upon the state of health of the child, the qualifications of the teacher, the disposition and capacity of the mother, the environment of the home and the equipment of the kindergarten.

STATISTICAL SUMMARY OF ANSWERS RECEIVED.

1. Of 119 replies from physicians, 66, or 55.46 per cent., were, for reasons medical or otherwise, in favor of kindergartens; 25, or 21 per cent., were unfavorable; and 28, or 23.50 per cent., were indifferent. Of those who gave unfavorable answers, answers were given chiefly on medical grounds because of insufficient or improper medical care.

2. Of mothers, with 70 replies, 43 were favorable, or 61.42 per cent.; unfavorable, 11, or 15.71 per cent.; indifferent, 16, or 22.85 per cent. Those in favor assigned the good results to social, moral and esthetic effects chiefly, and those of adverse opinion are chiefly based on insufficient physical care and danger of contagion.

3. Of 43 replies from superintendents and principals, 32, or 74.41 per cent., were favorable; 5, or 11.64 per cent., were unfavorable, and 6, or 13.95 per cent., were indifferent.

4. Of kindergartners, with 26 replies, 25, or 96.15 per cent., were favorable, and 1, or 3.84 per cent., indifferent.

5. Of 21 replies from primary teachers, 14, or 66.66 per cent., were favorable; 3, or 13.33 per cent., unfavorable, and 4, or 19.03 per cent., were indifferent.

6. From the standpoint of physicians: 42 favorable and 15 unfavorable replies came from the East; 17 favorable and 6 unfavorable from the Middle West; 3 favorable from the West; 2 favorable from the North, and 1 each favorable and unfavorable from the South.

7. As to the hygienic condition of the kindergarten, 12 kindergartners write particularly of proper and improper conditions of schoolrooms, ventilation, etc.

8. The best average age to commence in the kindergarten is five years.

9. 47.90 per cent. of all physicians favor kindergarten both for the rich and for the poor.

10. Concerning too early entrance to kindergarten, 48 physicians, or 40.33 per cent. of the total, have declared that this evil exists.

11. 40.33 per cent. of physicians admit greater susceptibility to contagious disease during kindergarten attendance.

DISCUSSION.

DR. ROTCH.—I am very much interested in this subject and I think that in the future we may be able to do a great deal by the proper management of the kindergarten. We should ignore the chronologic age of the child. Children should not be classified by their chronologic age, but by their special development. There are children of four years of age who may go and others of five who should not, for they may only have the development of three and one-half or four years.

DR. NORTHRUP.—In this age, when we are all interested so much in infant mortality, it may be well to think also along the line of preserving the children that are a little older. I saw the other day a child of six who sent me a nicely written note. She must have begun kindergarten when three. When I first went to school I was eight. In the future I think we may take more interest in the question of preserving these children while growing up.

DR. CHURCHILL.—I think the opinion about the kindergarten among medical men and a great many mothers arises from an erroneous idea of the true object of the kindergarten. The well-regulated kindergarten merely tries to *steer* the mental development of the child. It seems to me a logical thing to try to steer the young brain along well-regulated paths and that is all the well conducted kindergarten attempts. Unfortunately, I suppose, there is about one kindergartner in a hundred who properly grasps the idea. The kindergartner should be a very highly paid teacher, so that a very high class of women would be attracted to the work. The weakness of the system arises largely from the poor way in which it is taught by incompetent teachers. One objection raised is the lack of outdoor life that the children get, especially in the short days of the year, but this may be obviated to a great extent by having the kindergarten in the afternoon.

You often hear the statement made that the mother is the best trainer of the child, but the mother is not a professional, and I should much prefer to put the child in the hands of a professional than of an amateur. The kindergarten also tends to rub off the rough edges.

I have in mind a certain school in Chicago where the element of competition is entirely eliminated; no prizes are given; no attempt made to introduce that element. On the contrary, the spirit of helpfulness is taught. Personally, I am a thorough believer in the kindergarten, and I think we should try to steer the mental development of the child at as early an age as possible.

DR. CHAPIN.—One point that Dr. Churchill has made is very important, namely, that teachers for these young children should be better paid and have a better status than they do. The whole thing is radically wrong in our public school system. The teachers are graded according to the size of the children they teach. The early age is the critical time and yet they have the less experienced teachers. Some years ago I inspected the public schools of the lower East Side of New York, and found that the youngest children had the worst of everything; the poorest desks, the poorest seats, the rooms poorly lighted, and the teachers were the youngest. They allowed sixty pupils to each teacher. That is contrary to all principles of pedagogy and psychology. As these teachers become experienced they are promoted and take charge of the larger pupils. Associations of this kind should bring to the attention of educators that this system is not right.

DR. KERLEY.—My idea of the question is that it rests entirely with the surroundings of the child in his home. If the child can have outdoor life and proper attention at home, that is by far the best place. On the other hand, there are classes of children in every city to which the kindergarten is a godsend; children who go from squalor and dirt and bad air to well-ventilated rooms to be taught how to play, the necessity for keeping themselves clean, and the rudiments of living.

URTICARIA SYMPTOMATICA INFANTALIS, also called lichen urticarus, or urticaria papulosa, may be caused by parasites (pulex, cimex, etc.); by dentition (reflex), by autointoxication from various organs (thyroid), while anemia, rachitis, etc., predispose the patient to this troublesome disease. Sometimes no cause can be discovered and the disease is then catalogued under the neuroses; in other cases it is followed by a typical prurigo of Hebra. Scharff (*Therap. Monatshefte,* November 10, 1907) treats these cases with ichthyol internally and externally, not forgetting to diet the patients, and speaks highly of his good results with this treatment. He gives 10 drops of a 10 per cent. solution of ichthyol three times a day to a baby under one year; 10 drops of a 30 per cent. solution three times a day to a child three years, and 5 drops of a 50 per cent. solution three times a day to a child of six years and over. Externally a lotion of the following combination is applied twice daily, followed by an amylum dusting powder: Ichthyol, 5.0; glycerin, 5.0; aqua dest., ad. 100.0 Or an ointment as follows: Ichthyol, 10.0; adipis lanal, 20.0; vaselin flav., 40.0; aqua, dest., 100.0 Any disturbance in the gastrointestinal tract should be looked after.—*Interstate Medical Journal.*

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CONGENITAL HYPERTROPHIC PYLORIC STENOSIS.*

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In the field of pediatrics it is scarcely possible to find a disease or condition more difficult of diagnosis, classification and treatment than the syndrome which characterize obstructive conditions at the infantile pylorus.

Little knowledge of, or at least interest in, the condition is shown in the literature from the first case published, that of Dr. Hezekiah Beardsley, in 1788, down to the report of the two cases of Hirschsprung, in 1887, with the exception of the case reported by Williams, in 1841, in the *London and Edinburgh Monthly Journal of Medicine,* and that by Davoski, in 1842, in Caspari's *Wochenschr. fur der Ges. Heilkinde.* Since the publication of Hirschsprung's cases, reports have been more and more frequent, more clearly defined, and the details of the individual cases more definitely stated. Unfortunately, the bitterness and acrimony which characterized the discussion of these early cases destroyed, to a great extent, their value as guides for present day diagnosis and treatment. Eric Pritchard, in the ARCHIVES OF PEDIATRICS for April, 1900, collected the records of twenty-three fatal cases, by fourteen observers, with an autopsy record in all but one. The symptoms, physical signs and autopsy findings are widely different in this list of cases. In several, diarrhea more or less persistent was prominent, and in most of the cases the description of the character of the stools is incomplete or entirely wanting. Regarding the autopsy findings, we find such statements as: "Medium sized sounds could be passed through the opening," "Lumen about the size of pencil," "Pylorus hardly allowed small finger to pass through lumen," etc., etc. As all these children died in the early weeks or months of life, the pyloric openings for that period of life, in some of these cases at least, were extremely liberal, and hence not cases of actual anatomical stenosis. However, muscular thickening is reported in a number where the pyloric opening was of normal or more than normal dimensions, in which cases the spasmodic element doubtless predominated plus the hypertrophy. In December of 1904, in Archives of Pediatrics, Drs. Shaw and Elting report an operative case with recovery, and bring the literature well up to date. They collected 66 cases from 1788 to 1904, in which the diagnosis was confirmed by autopsy, and 12 in which no autopsy was reported. They also report 27 cases diagnosed as hypertrophic pyloric stenosis ending in recovery; 19 cases in which gastroenterostomy was done, of which 12 died and 7 recovered; 1 case of pylorectomy which was fatal; 8 cases of pyloroplasty, of which 5 recovered and 3 died; and 11 cases of Loreta's operation (divulsion), of which 5 recovered and 6 died. Their conclusions are:

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* Read before the New York Academy of Medicine, Section on Pediatrics, February 11, 1909.

"First:—That pyloric stenosis in the infant is of much more frequent occurrence than is commonly supposed.

"Second:—That medical treatment of these cases has proved fatal and unsatisfactory.

"Third:—That surgical interference should be practiced before the strength and the vitality of the patients have become seriously reduced.

"Fourth:—That either pyloroplasty or anterior gastroenterostomy is the operation of choice."

In the *Brooklyn Medical Journal,* for May, 1903, Dr. F. W. Shaw reports the case of a boy five years old who suffered from recurrent attacks of abdominal pain and vomiting, each attack lasting several days. He finally succumbed to an attack lasting ten days. Autopsy revealed a hard resisting mass of muscular tissue at the pylorus; and while the canal admitted a probe under pressure it was absolutely tight to fluids. This case demonstrates that a degree of actual anatomic obstruction can exist for a considerable period with remissions and exacerbations; *i.e.,* partial stenosis made complete at times by spasm. Cases should not be reported cured until after a considerable period of observation during which all evidences of stenosis should be entirely and constantly absent. Russell, in the *British Medical Journal* for July, 1908, reports 3 cases of congenital pyloric stenosis in adults, thirty-four, forty-two, and fifty-one years respectively, and states that between actual attacks of stenosis there existed gastric dilatation and dyspeptic symptoms leading back to childhood. Thirty-one cases of this character have been reported by Landerer and Maier, and by Knasnobeyoff 5 cases, including 3 of his own.

Dr. Koplik, in a masterly analysis of the subject, in the *American Journal of Medical Sciences,* July, 1908, has done much to harmonize the various theories regarding the nature, pathology and treatment of this affection. He recognizes (1) A purely congenital pyloric spasm, primary or secondary, without probable or demonstrable anatomic obstruction. (2) Pyloric spasm in which there is a probable demonstrable anatomic obstruction. (3) Congenital pyloric stenosis with demonstrable lesion, in which the element of spasm is without material importance in the progress and treatment of the case. A given case may at different periods fall under any of these classes, notably so with the first two. Differentiation is naturally most difficult in the second class. These cases may be unnecessarily operated, or the treatment may be continued along conservative lines, until the child is unable to withstand an operation, or perishes from inanition.

Symptoms.—Whether the case be one of pyloric spasm, or a congenital hypertrophic stenosis, one symptom leads all others; namely, vomiting. In all the obstructive conditions of the pylorus, the vomiting is projectile in character, containing most of the food taken, with mucus and gastric secretion. Occasionally in pylorospasm the vomitus may contain traces of bile. In several cases reported, and in one about to be reported, the vomiting was occasionally bloody. It is probable that blood very rarely occurs except in cases of rather complete hypertrophic stenosis.

Next in time and importance, is constipation and diminished secretion of urine. The character and amount of feces, together with the frequency of evacuations, is an important factor in differential diagnosis, and a valuable guide in treatment. Stools though infrequent and small in amount, which contain fecal matter in various proportions, naturally suggest an incomplete stenosis, and in the absence of visible peristalsis and pyloric tumor, would probably be associated with the condition known as pylorospasm of either the first or second division of Koplik's classification. Such cases would probably be treated medically; and, other things being equal, an expectant and conservative course would be justifiable for a longer time than in congenital hypertrophic stenosis. The urine in these cases is diminished in quantity, and stains the diaper red, from deposition of urates, but the paucity of urine is not so great in the spasm cases as in cases of congenital hypertrophic stenosis. In cases of spasm, while characteristic peristalsis cannot be demonstrated, or readily induced, and pyloric tumor is absent, there probably is a measure of hypertrophy of pyloric muscle. It is only on this supposition that the autopsy findings of the various observers reported by Pritchard, in which there were patulous pyloric orifices, a number of which were almost pathologically liberal, can be reconciled with vomiting, diminished feces and urine, and other cardinal symptoms which were in evidence.

Malnutrition is obviously a more or less prominent feature of every case of pyloric obstruction, its extent depending upon the degree and chronicity of the stenosis. Most of these children are normal and plump at birth and may even gain slightly in weight during the first few days or weeks of life. The large majority have been breast-fed.

It is probable that under critical observation excessive regurgitation and vomiting would characterize most of these cases from the beginning. Notably those falling under Koplik's third division, viz., congenital hypertrophic pyloric stenosis.

Physical Signs.—In some of the spasm cases, notably of Koplik's second division, and in all of those falling under the third division, visible peristalsis, either spontaneous or induced, can be demonstrated. The waves begin under the left costal arch, travel downward and across the abdomen where they are lost in the region of the pylorus. Peristalsis is best observed during nursing. The waves succeed each other with increasing rapidity, until if vomiting is to take place in a case with marked stenosis, they finally merge into each other, the stomach seems to rise and forcibly contracting, project its contents through the mouth and nasal passages some distance from the patient.

The shape of the abdomen in these cases is characteristic, the stomach being prominent and the lower abdomen flat and flaccid.

Etiology.—Many theories have been brought forward to account for the hypertrophy. In the cases that manifest the symptoms of obstruction within the first six weeks of life, in which class a very large majority of the reported cases will be found, it is not conceivable that this mass of well organized muscular tissue could develop after birth. It must be prenatal and brought about by some vagary in the process of development, or by ill-balanced, prenatal, gastrointestinal activity not now understood. The hypertrophy may be the result of reduplication where two centres of development join. Starling has recently called attention to the presence of definite chemical substances secreted in the stomach, chiefly in the pyloric portion, known as hormones; the function of which is to influence the muscular movements of the stomach. The possibility of the presence of these bodies, or similar ones in the prenatal organ causing unbalanced muscular hyperactivity is reasonable. Some have attributed the cause to the swallowing of irritant liquor amnii, and it is possible that in some cases this may be a factor.

Case Report.—The subject of this report, Dorothy J. I., was born October 7, 1908, after an uneventful labor. The child was vigorous and large, weighing about nine and three-quarter pounds. She was put to the breast about four hours after birth. Thereafter she was nursed every two hours regularly during the day and once or twice during the night. The supply of milk was large, and from the beginning we were obliged to relieve the mother's breasts with a pump. The milk so procured was taken to the Englewood Hospital in sterilized bottles two or three times daily and fed to a weak premature child in my service there, who, while on this milk improved markedly. This afforded an excellent clinical test of the nutritive properties and digestibility of the mother's milk.

When Dorothy was about six days old the nurse called my attention to the fact that the baby vomited in a forcible manner soon after nursing. About the tenth day, I observed this vomiting, which was beginning to be projectile in character. The stools contained a very small amount of fecal matter, partially yellow. Notwithstanding the copious vomiting she weighed at the third week eleven pounds. For about two weeks the weight remained stationary, after which she began to lose, reaching nine and one-quarter pounds on December 3d. Bowel movements which had never been large, about the latter part of November became scant, infrequent, containing no fecal matter, of a foul, unnatural odor, and an olive green, or brown color. The urine became scant, and left a reddish stain on the diaper. From October 28th to November 25th, observations were made from time to time as to the rapidity of the nursing, and various plans adopted to induce the child to nurse more deliberately. This was followed by no improvement. The character and frequency of vomiting continued unchanged. Likewise the urine and bowel movements. After vomiting the child seemed exhausted and would occasionally drop into a deep sleep to awaken in a few minutes with intense hunger which would continue unabated until the next nursing. At times even two, three and four feedings would be retained, with varying degrees of discomfort. Eventually vomiting would take place after or during a feeding, when all the previous feedings would be ejected. The amount and character of the vomitus suggested that little if any milk had been retained.

During the early weeks in November several examinations of the abdomen were made, and the region of the stomach always found distended, while the lower part of the abdomen was flat and soft. Baring the baby's abdomen while nursing gave an excellent opportunity for observing peristalsis, which took place with every nursing to a greater or lesser extent, but was most marked at the nursings during which vomiting took place. When first put to the breast she would seize the nipple with eagerness, draw several times vigorously, when a wave of peristalsis developing she would make grimaces, strike out with hands and feet and either suspend nursing or drop the nipple to return again when the painful peristalsis subsided.

On December 1st, it became evident that the baby was losing weight rapidly, and the vomiting was becoming more and more severe. On the night of December 1st, the vomiting was more copious and painful than usual, and with the milk and mucus there was mixed a considerable quantity of dark brown material, which responded to the test for hemoglobin. Diagnosis of congenital hypertrophic pyloric stenosis was made, all the symptoms and physical signs necessary now being present, except the palpable pyloric tumor. December 2d, Dr. Jacobi was called in consultation and confirmed the diagnosis. He suggested that we try medical treatment for a brief period. Accordingly she was placed on dionin .001, every three hours, to be gradually increased until physiological effect. Enemata of salt solution were given more freely, and lime water was introduced into the stomach just prior to nursing. During December 3d and 4th the vomiting seemed less painful and the peristalsis during the nursing less marked. In addition to the medicinal treatment we now determined to nurse the baby at shorter intervals and rather frequently. This resulted in the retention of one or two feedings, but all the food was invariably expelled when vomiting took place. December 5th she refused her feedings several times, during which time she was fairly comfortable. Report on December 6th stated that she had not taken nourishment readily since 3 P.M. December 5th, specimen of urine was obtained and was found to contain acetone. December 7th showed slight gain in weight, nine pounds and eleven ounces. December 8th, weight stationary. Vomiting severe, no fecal matter in bowel movements. Vomited more blood. December 10th, weight stationary. During evening little patient suffered severe pain which was relieved after vomiting of thick curds and ropy milk. December 11th, more blood vomited. Weight reduced to nine pounds, six ounces. December 12th, weight reduced to nine pounds, two and one-quarter ounces. In the meantime, feeling convinced that an operation would be necessary to save the baby's life I consulted Dr. B. F. Curtis. On December 13th with Dr. Jacobi acquiescing, the baby was removed to the Englewood Hospital for operation.

December 17th, second operation took place, returning from the operating room at 3:35. At 5:35 she had 5 c.c. of water with a drop of brandy; 6:35 she had 15 c.c. of mother's milk through dropper which was retained, sleeping from seven until eight. Every three hours during the night she received 25 c.c. of mother's milk by dropper and nutrient enemata composed of white of egg, somatose, and normal saline. At 10 P.M., 1 A.M., 4 A.M., 6 A.M., small amount of milk regurgitated. December 18th, baby was taken up and held in a semi-sitting posture after feeding. This partially controlled regurgitation. During the day flatus, the first in weeks, was expelled rather freely. December 19th, feeding by dropper was suspended and the baby put to the mother's breast. It nursed with vigor and retained most of the milk. Nursing was continued for longer periods until December 22d, when she was permitted to nurse for five minutes every two hours. On this date she had her first normal infantile stool. December 23d, head sweating was noticed while sleeping. Nursing tried for longer than five minutes but had to be abandoned. December 24th, returned home and nursing periods increased to six and eight minutes. December 27th, weighed for the first time since operation, eight pounds, eleven and three-quarter ounces. From this time to February 6th, gain was steady except for three days in the middle of January, when there was a little vomiting, not, however, projectile in character. On February 11th (today), weight was twelve pounds, two ounces.

Conclusions.—The writer is in full accord with the classification of Dr. Koplik regarding pyloric obstruction, and that while it seems impossible to arbitrarily outline each condition as entirely distinct and separate from others, it nevertheless gives us a clearer understanding of the conditions and reconciles the apparently discordant and contradictory reports thus far made.

Second. The case just reported must fall in Koplik's third division of congenital hypertrophic pyloric stenosis. The symptomology and physical signs, operative findings, and final results, fully confirm diagnosis, and justify the treatment.

Third. The general and popular notion that infants do not bear surgical operations well should be modified. Starved, atrophic and partially moribund infants are not favorable surgical cases.

Fourth. Degrees of stenosis not promptly and entirely relieved by conservative treatment should be operated before the child is too reduced to endure surgical treatment.

I wish to express my obligations to Dr. D. S. D. Jessup, for microscopical sections and pathological report.

FEEDING IN INFANCY.—*Cornell* (*Journal South Carolina Medical Association,* October, 1907) insists on adapting the stay in bed for the mother after childbirth, on account not only of the involution of the uterus, but also of its effect on the child. There are cases in which enforced idleness after the cessation of the lochial discharge has caused irritability on the mother's part, which shows its effect on the infant. He protests against unnecessary and indiscriminate handling of the young infant, and says that the baby in this stage of its existence has just five things to do—eat, sleep, urinate, defecate and cry, and only for such needs should it be handled. He considers it a great pity that pediatrists are not also obstetricians and vice versa. The obstetrician has charge of the baby before, during and after birth, and knows all the ins and outs of the mother's temperament. In artificial feeding the only safe rule to follow in starting a milk diet is to begin with everything—fat, sugar and proteid—low. He cautions, when a nursing child of eight or nine months suddenly and without apparent cause becomes upset, not to neglect to make sure by examination that the mother is not again pregnant.—*Journal of American Medical Association.*

PARTIAL PYLORECTOMY FOR FIBROMYOMA IN AN INFANT NINE WEEKS OLD.*

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The operation which we report is of surgical interest because it offers a possible method for the removal of benign tumors of the pylorus without opening the cavity of the canal and without entirely separating the stomach from the duodenum—both modifications simplifying the performance of the operation.

The patient was an infant nine weeks of age, who had a congenital obstruction of the pylorus, as described by Dr. Bell. It was in fair condition at the time of operation.

The operation was performed at the Englewood (N. J.) Hospital, December 13, 1908. Ether anesthesia was employed. Dr. J. Finley Bell and Dr. John Douglas assisted. The patient was held on a table inclined at 45°, head down. The abdomen was opened by an incision about two inches long in the linea alba above the navel. A stomach tube was passed after the abdomen was opened, and gas and fluid contents expressed—remains of the lavage done beforehand. The pylorus was isolated by gauze packing and it was found to be the seat of a tumor which occupied principally the free border, although there was some thickening of the walls in the entire circumference. Owing to this eccentric position, a transverse section through the pylorus would have resembled somewhat a signet ring, with an obstructed centre displaced far from the seal. The tumor was covered with normal peritoneum, was densely hard, and about 1 cm. in diameter, rounded, and tapering to the normal tissues on all sides without definite demarcation.

An incision, made transversely where the stomach wall appeared of normal thickness, disclosed the fact that the mucous membrane was normal and could be easily detached from the inner surface of the tumor. I at once hit upon the plan of leaving the mucous membrane intact and excising only the muscular and peritoneal coats, and also leaving the superior border of the pylorus, corresponding to the lesser curvature of the stomach. This was accomplished by two transverse incisions made at the gastric and intestinal limits of the tumor on the free border of the pylorus, carried upwards in front and behind, converging as they approached the superior border of the pylorus and united by two very short longitudinal incisions at their upper limits both anteriorly and posteriorly. The mucous membrane was not divided by these incisions and was bluntly peeled from the internal surface of the part removed, so that it was left as a thin sleeve, being injured only by two small punctures, which were at once closed by sutures. The superior or attached border of the pylorus was left intact, forming a bridge about 0.5 cm. long and wide, connecting the stomach and duodenum, the mucous membrane sleeve forming the rest of the tube. The incision across the duodenum measured about 2 cm. That across the stomach between 3 and 4 cm. The wound was in shape an irregular, spherical quadrilateral.

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* Read before the New York Academy of Medicine, Section on Pediatrics, February 11, 1909.

The wound was closed by fine silk interrupted sutures passed in two tiers, taking up only the peritoneal and muscular coats. The gastric and duodenal borders were drawn together without difficulty in spite of the difference in length of the incisions on the two sides. The abdominal muscles were united by a continuous suture of chromic catgut, and the skin was brought together by a plain catgut continuous suture.

The operation lasted thirty-six minutes, including an interruption of about ten minutes due to rigidity and defective respiration. The ether was badly borne, the child being cyanotic, with a tendency to muscular rigidity in spite of the greatest care and skill in the administration of the drug. About 100 grams of ether was used in all.

At the conclusion of the operation a couple of ounces of normal saline solution was injected into the rectum. The child showed some shock, pulse 140, respiration 28 per minute. At 9 P.M. the rectal temperature was 102°F.

The tumor was extremely hard and dense, and involved only the muscular coats. Microscopically it proved to be a fibromyoma.

As will be seen by the data given by Dr. Bell, the pyloric opening was patent at first, as shown by the appearance of bile in the vomited material. The vomiting gradually became as severe as before the operation, and the appearance of considerable amounts of broken down blood-clot led me to suppose that reactionary swelling of the sleeve of mucous membrane and perhaps the formation of a hematoma beneath it, had produced a complete obstruction of the enlarged orifice. As time did not relieve this obstruction and as the child was rapidly losing ground in spite of the docility of the rectum under the nutrient enemata, it was determined to reopen the wound and to endeavor to restore the patency of the canal.

December 17th, therefore, four days after the operation, the child was anesthetized with the same preparations as before—washing out of stomach, low position of head on inclined table, etc. In view of the bad effects of ether previously observed, chloroform was substituted.

With the assistance of Dr. Bell and Dr. Douglas the abdominal wound was reopened. The catgut in the skin had been absorbed prematurely and the edges of the incision had separated under the strain of the repeated vomiting. The chromic gut in the muscle also seemed to be very soft, although it had not given way. The wound in the pylorus was very firmly closed by plastic material, and instead of being stretched apart in the external layers as is usually seen, the parts were even more inverted than they were originally, the superficial tier of sutures being rolled in almost out of sight. Some of the sutures on the anterior border were removed, the adhesions separated, and a portion of the redundant mucous membrane was cut away. No sign of edema or hematoma was observed. Two tiers of interrupted fine silk sutures closed the wound in the pylorus again. The first tier included the cut edge of the mucous membrane as well as the muscular coat. Care was taken not to invert the wall of the stomach so strongly as it had been at the first operation, and when all the sutures had been inserted the air in the stomach was driven through into the intestine, proving the full patency of the canal. The abdominal wall was sutured by a few interrupted through and through sutures of chromic catgut. Time of operation twenty minutes.

The anesthesia was perfect and only about a drachm of chloroform was used. I would like to state here that my own preference is decidedly for chloroform as an anesthetic for young children. I have never seen a fatality from its use in them, and very rarely have alarming or dangerous symptoms been observed.

The child's appearance did not change during the operation, and there was no perceptible shock. At this time, however, the baby was very pale, the skin wrinkled, the lips blue, and the eyes sunken before the operation, so that the external evidences of shock would not be very apparent. The pulse was 144, and the respiration 46 per minute, and the evening temperature was 103.2°F.

The cause of the secondary obstruction was not, in my judgment, the redundant mucous membrane, but the secondary extreme inversion of the anterior wall of the pylorus, due to the contracting bands of lymph.

Feeding by stomach was begun very early, water in one hour, mother's milk administered by dropper in three hours, and nursing at the breast in forty-six hours after the operation. We felt that the threatening collapse from inanition justified us in disregarding the usual precautions to keep the stomach empty. Perhaps these precautions are not so necessary as we have hitherto thought. Vomiting soon ceased and then the nutrient enemata were discontinued—three days after the second operation.

As to the method of operation, the modification employed here appears to me to greatly simplify resection of the pylorus where it is not necessary to remove the part entirely, that is, for certain cases where there is no malignant disease. I would recommend, however, that the redundant mucous membrane be pinched up in a transverse fold, and the base of the fold rapidly sutured by a through and through continuous suture. The redundant part could then be cut away without opening the lumen and the danger of escape of contents would be avoided. The remaining bridge of tissue at the superior or attached border of the pylorus greatly facilitates the suturing of the muscular layers and lessens the amount of blood lost. In this case there was absolutely no bleeding from the pyloric wall. The operation resembles in these respects pyloroplasty rather than pylorectomy. The sutures should of course be introduced first at the angle of the wound on the posterior wall of the pylorus, gradually working forwards.

As to the possibility of recurrence of the fibromyoma, it is hardly imminent enough to require very wide removal of the tissues. Certainly in these young children it is all important to make the operation easy and rapid. Even if recurrence should take place, a repetition of the operation, or the performance of a gastroenterostomy, some months later, after the child has gained more strength, is preferable to running any risk of losing the baby by the prolongation of the primary operation. It seems to me that partial pylorectomy in cases similar to this one, and pyloroplasty in cases of narrow pylorus without tumor, should give better results and should be easier of performance than gastroenterostomy where the parts are so small, but this opinion is entirely theoretical, as the foregoing case is the only one that I have had under my care.

CLINICAL MEMORANDA.

INTUSSUSCEPTION IN PURPURA, WITH THE REPORT OF A CASE.

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AND

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Purpura is a symptom-complex, not an independent disease. It may be divided into symptomatic and primary, according to whether or not it is secondary to, or a complication of, some other disease. In all probability it is always a symptomatic condition, the cause merely not being evident in the cases apparently primary. No theory satisfactorily explains the etiology of all cases, and no theory as to the causation is proven. It is probable that the etiology varies with different cases.

It is customary to divide purpura, according to the symptomatology, into several forms, as if they were different diseases, namely:

Purpura simplex.
Purpura rheumatica (peliosis rheumatica-Schönlein's disease).
Purpura hemorrhagica (morbus maculosis Werlhofii).
Purpura abdominalis (Henoch's disease).
Purpura fulminans.

These subdivisions are wholly arbitrary and, in the writers' opinion, unnecessary and confusing. The various forms are all manifestations of the same disease, the variations in the symptoms being due entirely to the location of the hemorrhage. This location is apparently largely accidental. All combinations of symptoms are met, and most cases during their course will fall into two or more, or even into all, of the subdivisions. It is wiser, therefore, to drop all these names and to speak and think of purpura with hemorrhages and symptoms in different locations.

Weil has found plasmatic and delayed coagulation in purpura. He found that the condition of the blood in purpura was essentially the same as in spontaneous acquired hemophilia, in which condition the addition of blood serum causes normal coagulation. That is, there is something lacking in the blood, this substance probably being the coagulating ferment. He found that the injection of fresh blood serum in purpura was followed by an amelioration of the symptoms. His results have been verified by a number of observers in small series of cases.

Case 2,628.—A girl, seven years old, was admitted to the Children's Hospital September 3, 1908. The family history was unimportant. There was no history of bleeding. She was breast-fed and was healthy as an infant. She had had diphtheria when three years old, measles and scarlet fever when six, and several attacks of tonsillitis. She had been rather delicate since infancy.

Five days before admission an eruption was noticed on the legs and thighs. This was made up of areas about the size of the tip of the little finger, which were not elevated and which, although at first of a purplish color, changed to red in about twenty-four hours. These spots faded slowly and disappeared almost entirely in three days. The legs and feet were swollen.

Two days before admission a diarrhea began. The movements were at first fecal, but within a few hours consisted almost entirely of blood, with a very little mucus. There had been much vomiting of a greenish yellow fluid which contained mucus and was occasionally streaked with blood. There had been some fever. There had been no hemorrhage from the nose or mouth. There had been some pain in the right side of the abdomen.

Physical Examination. The child was in fair general condition. The general physical examination was negative. The abdomen was not distended and was tympanitic, except over a tumor, which could be felt on the right side just above the brim of the pelvis. This tumor was somewhat sausage-shaped, but varied a little in form from time to time. The abdominal muscles were rather tense. The mass was slightly tender. Rectal examination showed nothing further. The urine was clear, acid, and contained neither sugar, acetone nor albumin. There was a leukocytosis of 21,000.

Operation. Under ether the mass could be distinctly felt. It was about three inches long and lay behind the right semilunar line, the lower end on a level with the anterior superior spine of the ilium. It closely resembled a thick-walled appendicular abscess. An incision was made through the outer border of the right rectus, directly over the mass. It was found to be an intussusception into the cecum. The ileo-cecal valve was the advancing point. The intussusception had become rotated as a whole in such a way that the small bowel entered the large from above, at a point just beneath the liver. There was a little clear fluid in the abdomen. By combined taxis and traction, the rotation being at the same time untwisted, the bowel was reduced. The head of the cecum and ileo-cecal valve were much swollen and congested, and the peritoneum covering the head of the cecum was dark and roughened. The appendix was moderately swollen. The wound was closed with a small rubber tissue drain.

The condition after the operation was fairly good. The bowels moved several times during the third and fourth days, the movements being dark brown and apparently composed in part of old blood. The temperature remained fairly constant at about 100°F. and the pulse at about 130 during the next six days. On the seventh day after the operation the pulse rose rapidly to 150 and became decidedly weaker, while the temperature rose to 103°F. There was considerable vomiting and there were three severe intestinal hemorrhages. There was marked pain in the right side of the abdomen, which was a little distended. As a recurrence of the intussusception or ulceration of the cecum with beginning peritonitis seemed very possible, the child was again etherized and the lower portion of the old incision opened. The peritoneum covering the cecum, which had seemed much damaged, was absolutely normal. There was no evidence of any abdominal trouble and the wound was at once packed lightly with gauze. As a fresh eruption of purpuric spots had appeared on both ankles at the time of the hemorrhages, it was felt that they were due to a recrudescence of the purpura. 30 c.c. of rabbit's serum were given subcutaneously soon after the second operation, and 15 c.c. on each of the two following days. Gelatine was also given by the mouth. No more hemorrhages occurred unless such as were indicated by a few slight blood stains in the feces. A few more purpuric spots appeared about the ankles during the next few days. Two weeks and a half after entrance a mild paronychia occurred on two fingers, and there was a mild diarrhea, associated with loss of appetite and considerable apathy, which lasted for several days. Four weeks after entrance and three weeks after the second operation, there was a recurrence of the purpuric eruption on the arms and legs. 10 c.c. of human serum was given subcutaneously, human serum being used in order to avoid any possible danger from anaphylaxis. Recovery from this time on was slow, but uneventful.

This case, while very unusual, is by no means unique, as a number of similar cases have been reported, notably by Sutherland, Vierhuff, Lett and Döbeli. If the old classification is followed, it is one of Henoch's purpura complicated by intussusception. It is usually supposed that the intussusception in these cases of purpura is due to the local absence of peristalsis resulting from the hemorrhage into the intestinal wall. This explanation is not entirely satisfactory, however, as hemorrhages into the intestinal wall or into the intestinal lumen in other conditions are not followed by intussusception. Moreover, ulceration of the intestine does not cause intussusception. In Greig's case, in which laparotomy showed a swelling of the lower end of the ileum as the result of congestion, which was large enough to be felt as a tumor through the abdominal wall, there was no intussusception. Döbeli believes, indeed, that in abdominal purpura the purpuric symptoms are always secondary to some disease of the intestine, and that when there is an intussusception it is the primary condition. He reports a case of his own in which there were several intussusceptions from obstipation, each of which was followed by purpuric symptoms, and refers to several other similar cases in the literature.

In some instances the abdominal pain, vomiting and discharge of mucus and blood precede the cutaneous lesions or those in the joints or other mucous membranes. In such cases it is often difficult to determine whether the condition is purpura with abdominal symptoms or an intussusception. The character and onset of the pain do not help in the diagnosis, as they may be the same in both. Neither does a rise in the temperature, which is common to both. Intussusception almost always occurs before three years; purpura with abdominal symptoms is very rare before three years. Severe vomiting, especially if bloody, points toward purpura. General tenderness of the abdomen also points toward purpura, although it is often absent. The abdomen is seldom tender in intussusception except over the tumor. The presence of a palpable tumor is almost certain proof of intussusception, and practically rules out purpura. The absence of a tumor however does not absolutely rule out intussusception. In rare instances, moreover, hemorrhage into the intestinal wall may produce a palpable tumor, as in Greig's case, already mentioned.

In other instances the cutaneous and other lesions precede the abdominal symptoms. In these cases the chances are much greater that the abdominal symptoms are due to the purpura and not to a complicating intussusception. Our own case and the others referred to show, however, that an intussusception may occur as a complication of purpura with abdominal symptoms, and, therefore, must be considered as a possibility. The diagnosis in these cases must rest entirely on the presence or absence of a palpable tumor, as all the other symptoms may be caused by the purpura. On this account it is wiser not to operate in purpura with abdominal symptoms unless a definite tumor can be felt.

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ADENOID VEGETATIONS AND IMPAIRMENT OF HEARING.—Cohn (*Zeitschrift f. Ohrenheilkunde,* Vol. LII., p. 246). As an argument for the establishment of exact examination of the nose, throat, and ears in school children, the author gives the result of his investigations in 1,573 cases. Of this number 315, or about 18 per cent., were found to have a sufficient degree of impairment of hearing to make a professional examination advisable, although in the majority of them the impairment had not been noticed, either by the patients themselves or by the teachers. In 153 cases the impairment of hearing was directly referable to the presence of adenoids, and in 12 additional cases it was referable to the consecutive changes induced by adenoids which had spontaneously resolved. The number of cases in which adenoid vegetations could be regarded as the causative factor in the impairment of hearing in all the cases considered amounted, therefore, to about 52 per cent.; and the author lays stress upon the importance of a preliminary examination of all school children, both objectively and by hearing tests, at their entrance upon school life, as well as at later stated intervals, and gives the Bezold estimate of 2 meters, for the whispered voice, as the lowest acceptable standard.—*School Hygiene,* January, 1909.

ACIDOSIS IN GIRL OF NINETEEN MONTHS.—DEATH.*

BY HENRY E. HALE, M.D.,
New York.

My first experience with diacetic acid in the urine was five years ago when my daughter, then ten months of age, had an attack of cyclic vomiting. Since then I have seen seven other cases, one of them my son. The only one terminating fatally is the one about to be reported. Since my experience with this case my attitude toward the finding of this acid has completely changed. Instead of considering it simply an interesting finding, I regard it an important guide to treatment. I now give at once from two to four teaspoonfuls of milk of magnesia, at times repeated in a few hours, order soda bicarbonate or carbonate, by mouth or rectum or both, encourage the taking of water, and stop all food for from twenty-four to forty-eight hours. I am convinced also that when I see another case of this kind doing badly that I shall advise hypodermoclysis of physiological salt solution or a soda solution, probably a bicarbonate solution about 0.8† per cent., repeated as indicated by evidence of depletion of fluid.

At present my prophylactic treatment consists in a diet low in fats, milk of magnesia as laxative when such is needed, and the administering of calomel at regular intervals of two or three weeks, followed for one, two or three days by nightly doses of sodium phosphate, gr. xx, and sodium salicylate, gr. iii, in child of seven years. The very first sign of malaise or poor appetite is the signal for a urinary test for the acid. Care must always be taken never to mistake a drug reaction for that of diacetic acid.

There are several things to regret in connection with this case besides the death of the patient. Among other things, I regret exceedingly that there was but one urinary analysis, and that there was no autopsy.

I saw the patient first on November 17th at 8:30 P.M. The child had been fed five times a day, almost entirely on milk and cereal. The cereal, with cream poured from the top of a quart bottle of milk, made up the greater part of her breakfast. The other four meals consisted of whole milk, a little bread and butter, and possibly once a week potato. She had no eggs and a scrap of meat only about once a month. Her parents are vegetarians save for a semi-occasional meal with meat. Her father told me that they frequently went a month without any.

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† To sterilize, boil; this changes the acid carbonate to carbonate, but does not change the efficiency of the solution.

Since coming from up the state to New York City in the middle of September last the little girl had been miserable at frequent intervals, but was never really ill, and no medical advice had been sought.

For a month or a little more just previous to her fatal illness she would gag every morning upon getting up as though about to vomit, though she never did actually vomit. When she came to breakfast she ate well of the cereal and cream.

On the fourteenth of November she was apparently perfectly well. The next morning, to use her mother's expression, "She was dumpy, her appetite was poor, and she had some fever." There was no vomiting. That afternoon, at three o'clock, one and a half teaspoonfuls of castor oil were given, and at three o'clock the next morning the bowels began to move excessively. The first two stools were large and composed of fecal matter; the others, to the number of twenty-three that day and sixteen the next day, previous to my first visit, were said to consist of water, blood and mucus. The accuracy of this observation of the parents I question, for at the time of my first visit there was a bowel discharge in the diaper. It showed a little light green mucus some masses of white, wet powder, presumably unchanged bismuth, and much clear fluid soaked the diaper. There was no evidence of blood, and there was no foul odor.

During the 15th, 16th and 17th she had been fed solely on mutton broth. Though very thirsty, she had been allowed only small amounts of water. At no time had her thirst been satisfied. She had been given no medicine excepting subnitrate of bismuth.

On the evening of the 17th, when I first saw her, the child was apparently well nourished and bright, and did not appear very ill. At first sight her pallor was the most striking thing noticed. The rectal temperature was 101.6°F., pulse 132, regular and of good force; the respirations were 44 and regular. There was no action of the alæ nasæ, no respiratory grunt nor cough. The skin was white and perfectly clear, not a vestige of an eruption anywhere.

The superficial lymph nodes were not palpable. There was no strabismus, the pupils were equal and reacted well. There was no stiffness of the neck. The tongue was red and dry, almost free from any coating. The mucous membrane of the mouth showed nothing and the tonsils and pharynx were normal. The examination of the heart and lungs revealed nothing abnormal. The abdomen was flat, not sunken, perfectly soft and readily examined. Neither liver or spleen could be felt. There was no tenderness and absolutely no mass anywhere. There was no edema and the ears were normal.

At this time she was ordered outdoors in her carriage morning and afternoon, forbidden any food until I should see her again, in spite of the fact that she was hungry. Not realizing as I did later the probable nature of the diarrhea, I ordered salol gr. ½ and pulv. opii gr. $^1/_{10}$ in lactose every four hours. I also told the mother to give her all the water she wished, putting a half teaspoonful of sodium bicarbonate to the glass, and, if possible, to save a specimen of urine.

On the morning of the 18th the mother telephoned that the child had not voided any urine, though taking large quantities of water. In what proved to be an ineffectual attempt to relieve this condition, she twice put the little one in a tub of hot water, and while in the tub gave each time a high enema through a catheter. Upon my visit in the afternoon I found the child apparently improved, the stools were decidedly fewer in number, they contained no blood, the temperature was 100.8°F., the pulse 104. The respirations were not counted. The heart and lungs were devoid of adventitious sounds. The abdomen was perfectly soft, and nothing was felt that was not anatomical excepting a distended bladder reaching two inches above the symphysis pubis. This distention was relieved by catheter, and about 6 ounces of clear urine obtained. The patient was allowed for nourishment barley water with condensed milk (1 teaspoonful) and malted milk (2 teaspoonfuls), every three hours. The drug medication was unchanged.

The catheterized specimen of urine was examined separately by Dr. Edward Cussler and myself. The analyses agreed that the urine was clear, amber, acid, sp. gr. 1026 or 27, and contained no albumin, no casts, no sugar, no indican, but large amounts of diacetic acid. This was differentiated from the reaction due to salicylic acid.

On the 19th I called at 4 P.M. The urine was being voided with the stools. The child seemed decidedly better in spite of a slightly higher temperature, 102° F., pulse 136, and respirations 24. There had been only two stools in the last ten hours. These were less watery and contained considerable yellow fecal matter. She had slept well during the night and had taken her nourishment well. Physical examination revealed no new development excepting that the liver had become palpable just under the free margin of the ribs.

The directions this day were to give the powders only three times a day, and to give at each feeding one-half ounce more of the same mixture. The quantity of the soda was not increased because there seemed to be no indication for it. Had a specimen of urine been obtainable it would probably have given us a valuable suggestion to the contrary.

When seen on the afternoon of the 20th, she had taken nourishment only twice, seemed sick at her stomach, but had not vomited. There had been many yellow, watery, mucous stools with scarcely any odor. The child's appearance was not alarming. The temperature was 102.8°F., pulse 130, and the respirations were 24. Physical examination showed nothing new excepting a faint systolic precordial murmur. The child was very thirsty and, while I was present, took 12 ounces of water containing 1 teaspoonful of sodium bicarbonate, and wished for more. A specimen of blood was taken for Widal reaction and later reported as negative, though giving a partial reaction, and another specimen was requested. The powders were stopped and calomel ordered gr. 1 in divided doses.

The next morning I was telephoned for about seven o'clock, as the patient had passed a very bad night, had not taken any nourishment, was still very thirsty, and at times became unconscious. At 8 A.M. her temperature was 102.6°F., a shade lower than the afternoon before, her pulse was 124, and the respirations 24. The stools seemed to be composed of water and mucus. A digital examination of the rectum was made with negative results. Two small, gray ulcers had developed on the margin of the tongue near its tip. The urine was as before all lost with the stools. At this time she was ordered sodium bicarbonate (2 teaspoonfuls) in water by rectum every four hours, and barley water with egg albumen was substituted for the previous food.

Early in the afternoon I was again called and, upon arrival about 2:30, found the child in extremis, unconscious, pupils unequal, strabismus marked, and occasionally convulsive movements occurred, but there was as yet no true convulsion. The temperature was 105.8°F., pulse imperceptible at the wrist, 208 at the apex, and the respiration was of the Cheyne-Stokes type. Hypodermic stimulation was at once instituted and a consultation requested. Dr. F. S. Meara was called in. The patient's condition rapidly grew worse and worse, and a few minutes after Dr. Meara's arrival death was ushered in with a convulsion.

SERUM TREATMENT OF CEREBROSPINAL FEVER.—Drs. Currie and MacGregor (*London Lancet,* October 10th) analyze the cases of cerebrospinal fever in the Glasgow Fever Hospital between May, 1906, and May, 1908, in which the patients were treated with four different kinds of serum. The total number of cases was 330, of which 105 were treated with antimeningococcic serum. The beneficial results obtained were a delay in any of the fatal issues, and there were a greater number of recoveries. In most cases there was at least one injection into the spinal theca after withdrawal of cerebrospinal fluid. Repeated injections were usually subcutaneous; massive injections were necessarily so. The authors also state that the serum-treated patients, who survive the first ten days of illness, have a better chance of life.—*Monthly Cyclopedia of Medicine.*

VACCINAL IMMUNITY IN CHILDHOOD.—Comby (*Arch. de Med. des Enf.*) concludes that the immunity conferred by vaccination is at times lost very quickly. The duration varies very greatly in different subjects and we have no means of estimating this duration in a given case, even approximately. In the face of such variance prudence demands universal vaccination in times of epidemics, even of children who have recently been successfully vaccinated.

When a first vaccination is negative in a child, a second, a third, a fourth inoculation should be made if necessary, for it rarely happens that one does not get a positive result finally.

Even though it be admitted that vaccination will not in every case protect absolutely against smallpox, it should not be forgotten that any resulting infection in vaccinated cases is always mild.—*Medical Journal.*

EDITORIAL.

PROVISION FOR THE HOSPITAL TREATMENT OF WHOOPING COUGH.

Some months ago editorial comment was made in the ARCHIVES concerning the lack of provision in all great cities for cases of whooping cough and its complications. Through a communication just received from the secretary of the Medical Board of the Randall's Island Children's Hospital, we are made aware that for some months certain wards of this hospital have been set aside for whooping cough cases. Although this provision is entirely inadequate for the needs of Greater New York, in each of whose boroughs there should be such a hospital, it is very gratifying to know that there is some place where these cases can be properly cared for. In order that the good work being done at the Randall's Island Hospital should be more widely known, we take pleasure in reproducing entire the communication to which reference has been made.

WORK OF THE CHILDREN'S HOSPITAL ON RANDALL'S ISLAND.

Randall's Island lies in the East River opposite 120th Street. It contains about four hundred acres. One hundred acres in the southwestern portion are occupied by the House of Refuge, under the care of the State. This institution will shortly be removed to another location. The remaining three hundred acres belong to the Department of Public Charities and are used for the New York City Children's Hospitals and Schools. Under this name are grouped three institutions—the Children's Hospital, the School for Feeble-minded, and the Custodial Asylum for Idiots and Epileptics. During recent years there have been a daily average of about 500 patients in the Children's Hospital and 350 in each of the other institutions. But this winter these numbers have been increased, and in December the census showed 588 in the Children's Hospital, 391 in the School for Feeble-minded, and

579 in the Custodial Asylum. Beginning in the spring, a large number of the epileptics and probably a considerable number of the feeble-minded and idiots will be removed to the new asylum at West Haverstraw.

To care for all these children and dependent people there are on the island, a superintendent and a deputy, a staff of six physicians, a steward, a supervising nurse, a dietitian and assistant, and an army of 400 employees—cooks, engineers, farmers and helpers. Also, a staff of paid nurses, who are under training as children's attendants. Twenty-eight physicians constitute the visiting staff. As usual in medical boards, the hospital work is divided among the specialties of general medicine, general and orthopedic surgery, dermatology, ophthalmology, otology and neurology.

These hospitals are recruited from the special classes in the public schools, the truant schools, orphan asylums, and the charges of the Society for the Prevention of Cruelty to Children. The feeble-minded are sent here for special training. Children suffering from contagious diseases of the scalp and the eye are here in great numbers. They are segregated in wards, according to sex and disease. Owing to the poverty or indifference of their parents, they have practically grown up in neglect. Hence there are a great number of running ears. Many tonsil and adenoid operations have been performed; also a number for the correction of ptosis, ectropion and strabismus. The majority of the children on admission are anemic and ill-fed. They improve rapidly upon the wholesome food, fresh air and regular life on the island. There is a fair share of cripples. These receive the attention of the neurologist, the general surgeon or the orthopedic surgeon, as required. Conditions for the treatment of bone and joint cases are much more favorable on the island than in the ordinary tenement house. A neurologist holds a speech clinic once a week for the benefit of the lispers and stammerers.

Many medical problems have been worked out on Randall's Island and made the subjects of scientific papers. Among them may be mentioned: The relation of bovine to human tuberculosis, a study of birth palsies, a study of the fundus of the eye in idiots, spinal anesthesia and the implantation of thyroid tissue in cretins. The researches of the Rockefeller Institute for the germ of whooping cough were conducted here. One or two pavilions are always filled with cases of whooping cough or its complications. In so large a population, small epidemics of measles and scarlet fever occur, but are controlled by the quarantine regulations of the island. Every case is investigated and the infection can usually be traced to visiting friends. As these poor people make great sacrifices for the pleasure of making a trip to the island and seeing their children, it seems wiser to condone their ignorance than to deny them this privilege. Typhoid fever has been banished by the use of fly screens in all the windows. Food, fingers and flies are said to be the carriers of this disease.

About a dozen teachers are engaged under the supervision of the Board of Education. All the children of school age who are able attend school, but are not in graded classes. They make commendable progress. Much is done for the feeble-minded in the way of manual training, gymnastic work and orchestral music.

A training school for children's attendants is under the direction of the visiting staff. One class has been graduated. But the nursing department is much hampered by lack of sleeping accommodations. Plans have been drawn for a new nurses' home and the site surveyed. Only an appropriation is lacking. The dietary department holds equal rank with the nursing and each nurse must spend a specified time in the diet kitchen. The dietitian prepares special diet for the sick on prescription by the attending physician, and supervises the general food supply of the island.

Besides the chronic and subacute affections that have been mentioned, there is room on the island for a certain number of acute cases. It is hard to find a hospital that will take children suffering from diseases which follow convalescence from measles, scarlet fever or whooping cough, whether as sequelæ or not. We do not know how long the contagion may survive, and be active in the urine, in mucous secretions or purulent discharges. Randall's Island will take any disease not actually in quarantine by the Board of Health. Admission is now much easier since the adoption of the new regulation. Sick children over two years of age are immediately received on cards bearing the signature of a member of the Medical Board. A steam launch makes the round trip every half hour from the island to 120th Street and 125th Street.

Charles A. Kinch, M.D.,
Secretary of the Medical Board.

273 West 70th Street.

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Report of Stated Meeting, Held February 11, 1909.

DR. ELI LONG, CHAIRMAN.

A CASE OF ACUTE ACIDOSIS WITH DEATH.

DR. HENRY E. HALE read this paper. (See page 292.)

A CASE OF CONGENITAL STENOSIS OF THE PYLORUS.—OPERATIONS (TWO) AT EIGHT AND ONE-HALF WEEKS OF AGE.—RECOVERY.

DR. J. FINLEY BELL, of Englewood, N. J., read this paper. (See page 275.)

PARTIAL PYLORECTOMY FOR FIBROMATA IN AN INFANT NINE WEEKS OLD.

DR. B. FARQUHAR CURTIS made this report. (See page 283.)

DISCUSSION OF DR. BELL'S CASE.

DR. JOHN DOUGLAS said that he had seen it suggested that the use of carmine or charcoal might be of value in determining in these cases whether or not the pyloric stenosis was complete. The presence of curds in the feces of course would be of diagnostic value as well The vomiting of milk might be continuous, no milk passing through the pylorus, yet if carmine or charcoal passed through, it would prove that the pyloric opening was patent at times.

Dr. Bell had spoken of the various theoretical etiological factors, among others the swallowing of the liquor amnii, the resulting irritation and spasm being productive of hypertrophy of the pylorus. Dr. Bell's case showed a growth; it was more like a tumor macroscopically, because it was not concentric but eccentric, although microscopically it consisted entirely of smooth muscle fibers, and one could hardly imagine spasm causing such a growth. Cautley, in the *British Journal of Children's Diseases*, May, 1908, reported a case of hypertrophy of the pylorus in a seven months old fetus; this could not have been produced by spasm or irritation. Mayland (*British Medical Journal,* July, 1908) reported 19 operations for stenosis of the pylorus in adults, really a congenital abnormal narrowing as the result of non-development. There were no fibrous bands and no thickening of the muscular coats and no spasmodic contraction. Murphy and Morse and Wolbach, in the *Boston Medical Journal,* April 8, 1908, reported an autopsy done six and a half months after a gastroenterostomy for congenital stenosis of the pylorus, and they found the thickening was due to the thickened muscular fibers. At the autopsy no air or water could be passed through the pylorus. It would hardly seem possible for spasm to be an element in the causation, as after rigor mortis has passed there should be no constriction. It seemed to him that the kind of cases referred to in the various reports of congenital stenosis in infants differed from what was found in adults by Mayland where, in doing a gastroenterostomy, there was a narrowing of the pylorus, but no sign of thickening or spasm; it seemed possible that there could be a class of cases in infants where there was a congenital narrowing due to non-development as well as those cases in which there was spasm or hypertrophy or both combined.

So far as the treatment was concerned, there seemed to be much diversity of opinion as to the necessity of surgical treatment. Hutchinson had reported 14 cases with 13 recoveries with medical treatment. Carpenter had stated that "in the present state of knowledge, to assert that the surgeon should never be called in is hardly warranted by the facts, but, nevertheless, I think the advice should be, 'hardly ever.'" There must be a certain number of cases in which operation was necessary. When there was thickening or hypertrophy, or a congenital narrowing, which does not improve under medical treatment, in some cases the patient would die if no operation was performed.

Which operation was best? The most recent statistics (Bunts, *Surgery, Gynecology and Obstetrics,* June, 1908) give 114 cases operated upon; in these divulsion was done in 27, with 52 per cent. mortality; gastroenterostomy in 69, with 54 per cent. mortality; pyloroplasty in 17, with 53 per cent. mortality; and pylorectomy in 1, with 100 per cent. mortality. The most recent statistics was in 22 cases, a mortality of 41 per cent. for pyloroplasty (Champetier de Ribes, *Ann. de Gyn. and Obstr.*, March, 1908). And it must be remembered that the results in surgical cases are those obtained in the most desperate conditions where medical means have failed.

Dr. Douglas then called attention to the operation done on Dr. Bell's patient. Neither the stomach nor the duodenum was opened. After the operation the child apparently improved for a time; then it did not do so well, vomited, and it was thought that this was due to swelling of the mucous membrane or hematoma. This necessitated a second operation, as described, and the child recovered. There must be a certain number of cases that recover under medical treatment, and others that may come to operation. If these cases could be recognized earlier the surgeon would have a better chance to save the patient, and a submucous resection of part of the thickened tissue without opening the cavity of the stomach or duodenum, as done by Dr. Curtis in this case, or a submucous pyloroplasty as done in the case of Champetier de Ribes, should in the future give so much better results than in the past that the physician would have less hesitation in referring to the surgeon those cases which do not respond to medical treatment.

Dr. Henry Koplik said that it seemed to him that, in this particular case it was fortunate that the child was operated upon. This did not seem to be a typical case of hypertrophic stenosis of the pylorus for, as Dr. Curtis stated in his report, a transverse section through the pylorus would have resembled somewhat a signet ring, with an obstructed center displaced far from the seal. Dr. Koplik had never seen a similar case. This case was a tumor of the pylorus, and it had nothing in common with hypertrophic stenosis of the pylorus. It was a new growth, but it was operated upon with the mistaken idea as to its exact nature, and the child was well today.

He believed that Dr. Douglas stated his position in a very liberal and broad way; they were coming to the belief that these cases should not first come under the care of the surgeon. Ibraham, Feer, Koplik and others had shown 80 per cent. recoveries with medical treatment. Heubner, one of our best clinicians, gave 90 per cent. of recoveries. Ibraham spent three or four years in the study of this disease, and he stated that by medical means he cured 80 per cent. of the cases of congenital hypertrophic stenosis of the pylorus. When there was spasm with little hypertrophy the spasm usually subsided before the case came to operation.

Dr. Koplik said that he had had 20 cases of hypertrophic stenosis of the pylorus. Some of them would have been operated upon by the surgeon if the surgeon had had the courage to operate upon such weak children. In the cases where the surgeon wanted to operate, not only could a tumor be felt, but peristalsis was marked; yet these cases went on to recovery without operation. There may appear to be a considerable stenosis of the pylorus with spasm, yet after a while the spasm may relax and the patient get well. There were all varieties of these cases.

With regard to the indications for operation, many physicians think that an operation might be necessary if a tumor could be felt and peristalsis seen. However, a tumor, no matter how large and distinctly felt, may not be incompatible with recovery. Dr. Koplik had had two such cases where the pyloric tumor could be distinctly felt, and which was fully as large as the one passed around by Dr. Bell. Operation was not performed and the babies got well.

Dr. Clarence A. McWilliams said that if the surgeon was to be called in at all in these cases, medical treatment should not be persisted in too long, otherwise operation was a desperate chance. Dr. Koplik said that 60 per cent. of these cases could be cured by medical treatment. It was only through surgery that some of the remaining 40 per cent. could be saved. Statistics of numerous operations for this condition have shown from 40 to 50 per cent. of recoveries, which is not a bad showing when one considers the deplorable condition in which most of these cases have come into the surgeon's hand. This, too, has been at a time when stomach surgery was in its developmental stage and in future much better results should be obtained. The actual condition found to be present in the cases, which come to the surgeon, is one of increase in the muscular tissue, particularly the circular muscular fibers surrounding the pyloric opening of the stomach. Was this congenital or not? Possibly not, for the symptoms usually did not develop until two weeks or more after birth. Arguing from analagous conditions in the adult, it was not unreasonable to suppose that, as the result of some irritation, there had been some erosion or fissure in the pyloric region, and that there had also been hyperacidity of the gastric juice. These factors set up a more or less continuously acting spasm of the pyloric, as a result of which there was an hypertrophy of the sphincter of the pylorus. If proper medical treatment were instituted early in these cases, probably the immense majority would get well. The spasms would relax and more or less food would pass through the pylorus. But some few cases which resist intelligent medical treatment, and also those which might come late in the development of the disease were proper cases for the surgeon. The most important indication for operation was progressive and obstinate loss in weight. It was not fair to the child, the parents or the surgeon to expect the latter to save through an operation a mere mass of bones.

With regard to what was the best operation, the most favorable statistics are those of Nicoll (*Glasgow Medical Journal,* 1908) who operated upon 13 cases with only 2 deaths, or a mortality of 15.2 per cent., truly a remarkable showing. His operation was on the pylorus, making a V-shaped incision through the muscular fibers, but not through the mucous membrane. Divulsion also of the pylorus was performed through a separate incision in the stomach. The "V" was then sutured in such a way as to form a "Y." It was a simple operation and could be quickly performed. Besides that it did not send the child through life with a deformed gastrointestinal tract, such as would be the case when a gastroenterostomy was performed. Nicoll's procedure is the operation the speaker said he purposed to use in his next operation for pyloric stenosis in infants. It was probably only necessary to paralyze the sphincter of the pylorus for some time in order to effect a cure of the stenosis, as it was probably true that the hypertrophy of the muscle alone in itself never completely closed the pylorus. The speaker congratulated Dr. Bell on his judgment and courage in having skillful surgical measures instituted while the baby was yet in good condition, and the result amply justified him in his decision.

Dr. Bell said that some of the cases treated medically and reported to have been cured remain to be proven. Dr. Bell said he did not wash babies' stomachs much while suffering from this condition, as it tasked their strength too much.

With regard to this being a tumor and not a true hypertrophy, he admits that the growth was largely local; that is, the hypertrophy was more marked on the aspect of the greater curvature and the anterior aspect of the stomach than elsewhere. However, the distribution of the normal pyloric muscle structure corresponds in a measure to this form.

The microscopical section exhibited shows the growth to be composed of perfectly normal, unstriped muscular tissue, that is, a simple overdevelopment, which is a hypertrophy.

In this case the stenosis was complete. At the operation it was found impossible to drive water or gas through the pylorus, even when the child was fully under the influence of the anesthetic. He believes that in all the cases where the evidence points to a complete, or almost complete, obstruction sufficient to produce a marked loss in weight, that the medical course of treatment will be found more hazardous than surgical measures adopted reasonably early.

(*Remainder of report of February meeting will appear in the May* ARCHIVES.)

ADDISON'S DISEASE IN CHILDREN, WITH THE REPORT OF A CASE.—D. Felberbaum and E. A. Fruchthandler (*Boston Medical and Surgical Journal*, August 8, 1907) report such a case occurring in a child twelve years old. From the entire picture and termination the case was undoubtedly one of Addison's disease, complicated by vagabondism. There were unusual findings in the stools, each microscopical field showing a great number of oval egg-like bodies, measuring about four times the size of a red blood corpuscle. The cytoplasm appeared as a thin but distinct rim around a large oval nucleus, giving the impression of encysted protozoa. Various well-known pathologists examined and studied the feces, but were not able to determine the nature of these bodies. In the case reported there was also eosinophilia, and a termination by severe convulsions and coma lasting eight hours. In a survey of the literature they succeeded in collecting 25 cases, including their own, and in conclusion called attention to some of the more important facts which are characteristic of the disease, as follows: (1) Extreme rarity of the disease in children under thirteen years of age. (2) It is as frequent in boys as it is in girls. (3) Mildness of gastroenteric symptoms. (4) Peculiar condition of the hair. (5) Death usually under convulsions.—*New York Medical Journal.*

JOINT MEETING OF THE PHILADELPHIA PEDIATRIC SOCIETY AND THE PATHOLOGICAL SOCIETY OF PHILADELPHIA.

February 25, 1909.

JOSEPH McFARLAND, M.D., PRESIDENT.

SYMPOSIUM ON CHILDHOOD PATHOLOGY.

ANTENATAL PATHOLOGY.

DR. B. C. HIRST pointed out that the greatest waste of human life occurs in the nine months of intrauterine existence, the death-rate being 25 to 30 per cent. greater than at any other period in life of similar length. A few of the problems of intrauterine disease were considered—syphilis, deformities and the influence of maternal emotions and impressions. The duty of the physician to advise four years of treatment for the affected parent before attempting to beget children was emphasized, and the advisability of diagnosticating syphilis by a study of the fetal body or of the clinical signs in the living was pointed out. Otherwise an indiscreet questioning of the parents would disclose a secret which might disrupt the family.

The influence of maternal emotions and impressions upon the fetus was discussed. While the prevalent superstition that there might be a photographic reproduction of impressions upon the mother in physical defects of the fetus should be combatted and denied, it was necessary to admit that traumatism and profound emotions could arrest the physical development and affect the psychology of the fetus and could even terminate its existence.

INFECTIONS OF THE NEWBORN.

DR. S. McC. HAMILL discussed the localized infections of the umbilical stump and that large group of cases ordinarily described as infections of the newlyborn. He commented unfavorably upon the attempts to classify these infections on the basis of their symptomatology. He stated that true melena neonatorum was almost invariably the result of some form of infection. He did not deny the possibility of certain other factors, syphilis especially, acting in a predisposing capacity. In the light of Lequex's investigations, he thought that the failure to find the infecting organism in these cases has been dependent upon incomplete bacterial investigation. He did not accept the recently expressed opinion that melena neonatorum was a congenital malformation of the blood of unknown chemical nature. He could, however, conceive of the possibility of the toxins resulting from bacterial infection bringing about chemical alterations which might lead to free osmosis in the capillary vessels, resulting in widespread hemorrhages. The lowered resistance of the prematurely-born or weak infant, the dessication and shedding of the umbilical stump and physiological processes such as the early desquamation of the skin and mucosa, together with the undeveloped condition of the lymphatic system, threw open the portals of entry and led to ready infection when these infants are carelessly handled. He considered the most common portals of entry the skin, the umbilical stump and the gastrointestinal tract. The pathological picture in these cases was congestion, hemorrhage and the usual changes resulting from infectious conditions.

THE PATHOLOGIC ANATOMY AND PATHOGENESIS OF STATUS LYMPHATICUS IN CHILDREN.

Dr. John Howland, of New York, read this paper by invitation. He said that the consideration of thymus hypertrophy was rendered difficult by the lack of a normal standard. In the first two years of life this was variously given as anywhere between 5 grams and 30 grams. Illness caused great atrophy of the gland, while in sudden death it was believed to be frequently enlarged, and therefore the only conclusive method of determination was from patients suffering violent death, and these in the first two years of life were too infrequent to establish a standard. Fifteen grams probably represented approximately the average weight throughout the first two years of life, and yet it seemed probable that glands weighing considerably more than this were not very unusual and that the pathological complex known as status lymphaticus was very much more common than was usually supposed. Richter believed it to be perhaps the regular finding. The majority of authors did not subscribe to this view, and there was general unanimity in the acceptance of Paltauf's views in regard to status lymphaticus as a pathologic entity. There had been much discussion in regard to the evidences of compression at autopsy. In a few instances this had undoubtedly been present, but most authors with extensive postmortem experience believed it to be rare. As to the cause of death opinions varied greatly. A few authors (the most recent of them being Warthin) believed tracheal compression to be responsible for death; the majority opposed this view, but as yet no satisfactory explanation had been afforded. Paltauf laid stress only upon the type of individual dying suddenly. Strehla's experiments upon hyperthymization of the blood lacked confirmation. Recent experiments show that the glands normally or pathologically enlarged were no more toxic than other animal tissues. It had been suggested that the thymus hypertrophied to compensate for the lymphatic glands which were frequently found to have degenerated. Recent studies of normal thymus glands by Stöhr and Hammer indicated that the thymus was not composed of lymphoid tissue. If this was so, such an hypothesis seemed altogether improbable. At the end of twenty years after Paltauf's original paper, a satisfactory explanation of the cause of death was entirely lacking.

TUMOR GROWTH IN CHILDHOOD.

Dr. David Riesman said that it was impossible to give figures that will express the frequency of tumors in childhood as compared with their frequency in adult life. All tumors were represented in children. The connective tissue tumors, fibromas and lipomas are rare. Chondromas occur much oftener in combination with other tumors than as pure cartilaginous growths. Angioma (hemangioma) is frequent and is practically always congenital. It is most frequent on the skin, but is also found in the viscera and even in the nervous system. Chylangioma is rare. Osteoma is occasionally found in children, but it was difficult to distinguish at times between a genuine osteoma and an exostosis. Neuromas were comparatively frequent in childhood, their favorite seat being the eye, especially the eyelid. Myoma was a rare tumor in children. Rhabdomyoma was met in the kidney and occasionally in the heart. Liomyoma was exceedingly rare.

Sarcoma was probably the commonest tumor of childhood. It might be of any of the histologic varieties, though the round cell and lymphosarcoma were the most frequent. Giant cell and melanotic sarcoma were rare. The bones seemed to be the place of election, though it was frequent in the brain. In the internal organs sarcoma was rare in children, but when it occurred it was frequently congenital. Under the head of sarcoma Dr. Riesman considered chloroma, which occurred chiefly in the temporal and parietal regions of the skull and in the hard palate, sternum and ribs. It might be really a form of leukemia and not a tumor in the strict sense. Glioma was common in childhood, and in the brain was nearly as frequent as sarcoma. The most common of the benign epithelial tumors was the papilloma, especially common in the larynx. Carcinoma was rare. After deducting doubtful cases there remained only a few cases, the cancerous nature of which could not be questioned, occurring in the stomach and intestines. Hypernephroma was a peculiar tumor in the kidney generally derived from misplaced adrenal tissue. It was fairly common in childhood and had a tendency to cause metastases in the bones. The so-called mixed tumors were most commonly found in the kidney, producing enormous growths. Cysts also occurred in children, parasitic, retention, proliferative and dermoid cysts. Finally, true teratomas, being congenital, were naturally most frequent in early life.

THE NEUROPATHOLOGY OF CHILDHOOD.

Dr. D. J. McCarthy read this paper. He said that neuropathology in childhood did not differ essentially from that in adult life. We might find the same pathological processes but the results of these processes, so far as disturbance of function was concerned, were somewhat different, due in part to the incomplete development of the infantile nervous system. Pathological processes which caused relatively minor disturbances in adults might cause serious disturbance or even perversion of function when they occurred in infancy.

Retarded mental development had been studied clinically, embryologically and pathologically. Clinically the results were insufficient and unsatisfactory. Heredity, prolonged labor and instrumental delivery were of importance. Dr. McCarthy then discussed the pathological conditions found before birth and afterward upon which retarded mental development seemed to depend. The correlation between permanent as well as temporary visceral disturbances and minor mental and nervous conditions should be remembered.

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. A. W. BINGHAM. DR. C. D. MARTINETTI.
DR. HENRY HEIMAN. DR. M. NICOLL, JR.
DR. ALFRED F. HESS. DR. G. R. PISEK.
DR. S. W. THURBER.

DISEASES OF EAR, NOSE AND THROAT.

HEIM, DR. PAUL: FALSE CROUP AND THE NEUROPATHIC CONSTITUTION. (*Zentralbl. für Kinderhk.*, May 1, 1908, p. 12.)

Certain children develop croup whenever they "catch cold," also in the course of grippe, measles, etc. It will be found in most of such cases that the tendency is hereditary. The children show a neurotic disposition, are easily excited, have changeable temperament, often with increased reflexes, various tremors, and increased pulse rate. They usually give a history of various disturbances in infancy, restlessness, frequent crying, light sleep.

A catarrh of the larynx during an attack of croup has been demonstrated by a number of observers and is regarded as secondary to the spasm of the constrictors. The writer is in the habit of administering atropin in full doses, not only as a means of cutting short the attack, but as a preventative in children known to have this tendency. M. NICOLL, JR.

WOOD, GEORGE B.: THE IMPORTANCE OF THE UPPER RESPIRATORY TRACT IN THE ETIOLOGY OF CRYPTOGENETIC INFECTIONS, ESPECIALLY IN RELATION TO PLEURITIS. (*Annals of Otology, Rhinology and Laryngology,* December, 1908, p. 855.)

The question to be solved is: Given, an infection in the lymphatic tissue in the pharynx, is there a direct connection through a chain of glands to the pleura? The author has failed to establish this. After going into the morphology of the tonsillar crypts, he shows that unless the tonsil exhibits greater vital resistance than the surrounding tissues it is the most vulnerable spot in the throat. It can be proved that the tonsil does not hold antitoxic or bacteriolytic substances. The tonsils were involved in 69 per cent. of cases of pulmonary tuberculosis, and in many of these the tonsils were not large nor macroscopically diseased. Besides tuberculosis the tonsils were associated with the following diseases: Rheumatism, general septic infections, nephritis, tenosynovitis, bronchitis, pneumonia, pleurisy, appendicitis, jaundice, phlebitis, meningitis, parotitis and phlegmon of the orbit.

In summing up, he says that an anastomosis between the deep cervical glands and the supraclavicular group may exist in exceptional cases, but the direct path of infection from the throat to the pleural apex has not been established.

S. W. THURBER.

MERMOD, PROF.: SUBMUCOUS RESECTION IN OZENA. (*Annals of Otology, Rhinology and Laryngology,* December, 1908, p. 995.)

The author has never found a unilateral ozena where both nasal fossæ were of the same size and has always found a septal deviation and atrophic rhinitis on the larger side. He has succeeded by straightening the septum, in suppressing the cardinal symptoms of ozena. While submucous resection in children is not easy and may interfere with the development of the nose, yet a very gratifying result was obtained in a puny boy of ten years who three months after submucous resection seemed absolutely cured.

S. W. THURBER.

PATHOLOGY.

HAMILL, CARPENTER AND COPE: A COMPARISON OF THE VON PIRQUET, CALMETTE AND MORO TUBERCULIN TESTS AND THEIR DIAGNOSTIC VALUE. (*Archives of Internal Medicine,* Vol. II., No. 5, p. 405.)

The authors have made a careful study of the newer tuberculin reactions and have found all three to be equally reliable. None of them seem to be of value in differentiating latent or active tuberculosis. They report another case of corneal ulcer with permanent disturbance of vision as the result of the eye test, as well as instances of phyctenular and purulent conjunctivitis. As the result of these tests a very high percentage of tuberculosis was found in an orphan asylum containing children under eight years of age, and it is suggested that one of these methods be employed to separate the tuberculous in such institutions. No tuberculosis was found in infants under five months of age. Some experimental work on rabbits was attempted, but resulted negatively, possibly on account of the age of the culture of tubercle bacilli which was used.

ALFRED F. HESS.

BORDET: ETIOLOGY OF PERTUSSIS. (*Journal Medical de Bruxelles,* December 10, 1908, p. 800.)

Bordet reports that almost all investigators now agree that the bacillus described by him two years ago is the etiological factor of pertussis. Others extending his investigations have produced this disease in monkeys by direct and by contact infection; this has been accomplished in puppies by Klimenko, 20 developing the disease as the result of inoculation through the nose or larynx, and 24 others in consequence of contact with those already infected. These experiments, combined with the constancy with which the small hemophilic bacillus occurs in whooping-cough, are strong proof of the specificity of Bordet's micro-organism. When considered in conjunction with the agglutinating properties and complement fixing power of the blood of convalescent individuals it would seem as if the author has established his claim.

ALFRED F. HESS.

BING, ROBERT: RACHITIC MYOPATHY. (*Jahrb. für Kinderhk.,* December 8, 1908, p. 645.)

Numerous theories have been advanced in explanation of the muscular weakness which, as is well known, is such a frequent symptom in rickets. It has been ascribed to secondary atrophy from disuse, to laxity of the capsules and other periarticular structures, to a protective pseudoparalysis analogous to Parrot's pseudoparalysis in congenital lues, to loss of turgescence of the skin, and to changes in the central nervous system. None of these explanations is in full accord with clinical facts. With a view of solving this mooted question, the author undertook a series of pathological investigations. Sections of muscles excised during life or fresh postmortem specimens of 12 rachitic children were fixed and stained by the usual methods. In 4 specimens of children who had marked pseudoparetic hypotonia the following microscopic changes were seen: Indistinctness or disappearance of transverse striations, unusual distinctness of longitudinal striations, marked increase in number of muscle nuclei, dimunition in size of muscular fibrillæ, and disappearance of the sarcolemmæ. In the cases with moderate or mild hypotonia, the sections of the muscle tissue were normal in appearance. These changes do not correspond with those found in secondary atrophy or polymyositis. They most closely resemble the microscopic appearances which have been found in Rhabdomyoma, which is a tumor consisting of, but slightly differentiated, muscle tissue. In the opinion of the author these pathological changes are to be attributed to a degenerative process in the muscle tissue, the result of the metabolic changes which are present in rickets. They are of coördinate importance with the changes in the skeletal system. They are acquired in nature and complete restoration to normal is of frequent occurrence. HENRY HEIMAN.

MENSI, E.: ARTERIAL PRESSURE IN THE NORMAL AND ICTERIC NEWLYBORN. (*Riv. d' Clin. Ped.*, November, 1908.)

Mensi, in his clinical experiments, has employed Sahli's modification of the Riva Rocci sphygmomanometer, being particularly careful in every case to work under the same conditions as regards time of day, feeding and temperature.

His report covers experiments conducted on 254 newlyborn, and points to the following conclusion: In the newlyborn icteric, or about to become so, there invariably exists a lower blood pressure compared with that of normal children. This rule holds good also in those prematurely born. C. D. MARTINETTI.

MEDICINE.

TSCHERNOW, W.: ACUTE AND CHRONIC BRONCHIECTASIS IN CHILDREN. (*Jahrb. für Kinderhk.*, January 2, 1909, p. 64.)

During twenty-five years of private and hospital practice the author saw but 12 to 15 cases of bronchiectasis. In 2 acute cases, the histories of which are given in detail, purulent bronchitis and bronchopneumonia preceded the onset of the bronchiectasis. Bronchiectasis is produced by a combination of increased intrabronchial pressure with inflammatory changes in the bronchial walls. The latter may be caused by a purulent bronchitis or bronchopneumonia. The micro-organisms produce a ferment which dissolves the elastic tissue of the bronchial walls. With bronchiectasis is frequently associated pulmonary atelectasis, the result of an inflammation of the alveoli. The histories of 3 cases of chronic bronchiectasis are detailed. In one, the condition was due to the presence of a sunflower seed. When the foreign body was expectorated, the pulmonary condition improved markedly.

The characteristic symptoms in all the cases were intermittent expectoration of foul sputum, localized dullness with variable ausculatory signs, dependent on whether the bronchiectatic cavities were full or empty. The prognosis depends on the presence of peribronchial inflammatory tissue which is capable of organization and subsequent contraction, and on the extent of the sclerotic tissue in the surrounding lung area. Contraction of the cavity is more likely to take place in children on account of the greater abundance of elastic tissue and its greater regenerative power at this age. To this fact is probably due the infrequent occurrence of demonstrable bronchiectasis after measles and whooping-cough. The disease in some cases remains stationary for years. Exacerbations are likely to occur during attacks of bronchitis.

The first essential in the treatment of bronchiectasis is to find the cause. The author highly recommends frequent inhalations of the vapor of alkaline waters to which aromatic oils have been added. The following mixtures may be used: Oleum terebinthin, 10.0; oleum menthæ, gtt. xv; oleum juniper, 3.0; oleum terebinthin, 10.0; oleum bergamot, gtt. x; oleum eucalypt., 5.0. Fifteen drops of either of these mixtures may be added to the alkaline water, vichy or Ems in the inhaler. The sputum after inhalation rapidly loses its unpleasant odor.

Surgical interference is not advised unless one can demonstrate the existence of one large cavity, and the agglutination of the costal with the parietal pleura. Resection of several ribs may aid in the contraction of a bronchiectatic cavity. Guaiacol and thiocol improve the general condition and have a beneficial effect on the appetite and dyspeptic symptoms. Change of climate is of the greatest benefit. HENRY HEIMAN.

FINKLESTEIN, H.: ALIMENTARY INTOXICATION. (*Jahrb. für Kinderhk.,* November 7, 1908, p. 521.)

All the numerous clinical forms of disturbances of nutrition belong to one or the other of two fundamental types, namely, alimentary decomposition or alimentary intoxication. The former term is one employed by the author to express a condition which is usually designated as infantile atrophy. The condition has the following course: As a result of improper diet, a disturbance of nutrition occurs which leads to a chemical change in the constitution of the body and more particularly of the cells concerned with the functions of nutrition; this in turn produces a further disturbance of these functions and reduction in the tolerance for food; dyspeptic disturbances develop, and finally a condition sets in, in which the food instead of supplying nourishment to the body acts as a toxic material. The underlying basis of this condition is a reduction in the tolerance for food. The chief etiologic element is the fat in food. Starches and sugar have less influence in the development of this serious condition, while the proteids seem to play no rôle whatsoever. At any time during the existence of alimentary decomposition intoxication may set in. The latter occurs as a complication of the former, when more carbohydrates are ingested than can be taken care of by the cells of the body. Fats do not produce intoxication directly, but their influence in the production of decomposition and the consequent reduction of tolerance leads indirectly to the more ready occurrence of intoxication when carbohydrates are ingested.

Decomposition proper is always preceded by two precursory stages. These give distinct clinical pictures, but are of variable duration and severity. The first stage is that of disturbance of weight equilibrium of the body. The body temperature shows slight fluctuation, being either subnormal or subfebrile. At first the body weight shows only slight daily variations; somewhat later we find a gradual cessation of increase of weight. The body no longer reacts with normal increase in weight when the food is increased. The second precursory stage is that of dyspepsia. In this stage, in addition to the symptoms of the preceding one, we see the manifestations of fermentation of the food in the alimentary canal. The stools vary in character, but are always abnormal. Most of the symptoms are due to the carbohydrates in the food.

The stage of decomposition proper sets in with a marked and continuous loss of weight. The child becomes irritable, sleep is disturbed, and hunger seems to be a constantly present symptom. Pallor of the skin becomes marked, and is contrasted with the redness of the mucous membranes. The pulse becomes smaller and slower. The respirations are irregular and the expiration slow. In severe cases we have periods of apnea and Cheyne-Stokes breathing. The temperature is frequently subnormal. With the exception of the marked loss of body weight these symptoms contrast markedly with those seen in alimentary intoxication.

In the latter condition we have drowsiness, stupor, rapid pulse, rapid respirations, albuminuria and glycosuria.

Death may occur suddenly from cardiac collapse or respiratory paralysis.

The author divides the stage of decomposition into three periods.

In the first period restriction of diet results in weight equilibrium and marked improvement in the character of the stools after three to six days. Recovery is possible even with artificial feeding.

In the second period weight equilibrium is attained more slowly and after greater restriction of food; the abnormal stools are more persistent. Relapses readily occur when a more liberal diet is given. Recovery with artificial feeding is not likely.

In the third period weight equilibrium is no longer attainable. The stools remain abnormal, and death within a short time is certain. Every child who on attaining weight equilibrium does not show rapid improvement when the former diet is resumed, should be put to the breast, otherwise death or inanition is certain to occur. Breast milk acts as a curative agent in all but the last periods of decomposition. Even in human milk the fats and carbohydrates are injurious to the organism in the stage of decomposition, but their harmfulness is counterbalanced by some unknown constituent of the whey which produces an increase of tolerance for these elements of the milk. In severe cases breast feeding must therefore be begun with minimum quantities.

At any stage, decomposition may be complicated by alimentary intoxication, the first symptom of which is fever. This complication is usually brought on by the ingestion of carbohydrates, as is shown by the rapid disappearance of the symptoms when the latter is excluded from the diet. Digestive disturbance must be present for intoxication to occur. The amount of sugar necessary for the production of intoxication is of diagnostic and prognostic value.

HENRY HEIMAN.

DELÉARDE AND HANNART: TRACHEOBRONCHEAL ADENOPATHY AND RECURRENT LARYNGEAL PARALYSIS. (*L'Echo Médical du Nord,* April 12, 1908, p. 180.)

The patient, a male sixteen months of age, had suffered from marked dyspnea for three months. There was a history of syphilis in the father and suspected hereditary syphilis in the mother, the infant having been treated for this disease at four months. At six months there was interference with respiration, which increased in severity until the time of admission to the hospital when there was observed a very pronounced recession on inspiration which was noisy. There were cyanosis and swelling of the veins of the neck. At this time there was nothing to be seen in the larynx or trachea to account for the condition. Intubation was attempted three times without success, apparently on account of spasm of the glottis. Tracheotomy was immediately followed by relief of the symptoms. Radioscopy seemed to show enlargement of the bronchial nodes. Laryngoscopic examination now made warranted a diagnosis of abductor paralysis with contraction. The child's general condition gradually became worse and it died shortly after with the symptoms of acute general bronchitis. At autopsy there was found marked enlargement of the tracheobroncheal nodes without caseation, especially in the neighborhood of the left recurrent nerve. Very careful microscopic examination, together with animal inoculation, failed to determine whether the cause of the enlargement of the nodes was due to syphilis, tuberculosis, or was of the nature of a simple hypertrophy. M. NICOLL, JR.

AUSSET, E.: A CASE OF CONGENITAL MUSCULAR ATONY (OPPENHEIM'S DISEASE). (*L'Echo Médical du Nord,* March 22, 1908, o. p. 143.)

The patient was observed shortly after its birth not to use the limbs like other infants, to be inert, not caring to nurse, often for five or six hours. The condition seemed to improve up to one and one-half years, afterward remaining stationary. At four years of age, when first coming under observation, there was hypotony without atrophy of the limbs. The upper moving fairly well, the lower almost immobile. The electrical reactions were normal.

The writer is able to exclude pseudoparalysis due to syphilis and rachitis, as well as poliomyelitis.

In regard to the pathology the lesion was regarded by Oppenheim as purely muscular; others (Bing) have assigned as a cause a medulla-cerebellar failure of development. Berti, Cattaneo and Baudoin believe that a sclerosis of the thyroid gland.

may account for the condition. The prognosis is not regarded as hopeless. Massage, electricity, baths, strychnin, etc., it is believed, will restore the muscular tone. M. NICOLL, JR.

HYGIENE.

SACHS, T. B.: CHILDREN OF THE TUBERCULOUS. (*The Journal of the American Medical Association,* October 24, 1908, p. 1,413.)

Two hundred cases having tuberculous parentage were investigated; the conclusion was reached that infection of children by tuberculous parents must of necessity vary with the different conditions of life. Lack of hygiene, combined with enforced closeness of contact in the homes of the poor, facilitated the more widespread dissemination of the infective agent. Of the large number of children infected through close contact with tuberculous parents only a certain proportion present the well known manifestations of a fully developed disease of the lungs or other organs; in the vast majority the incidence of infection remains unrecognized. G. R. PISEK.

THERAPEUTICS.

LEES, D. B.: THE EFFECTIVE TREATMENT OF ACUTE AND SUBACUTE RHEUMATISM. (*British Medical Journal,* January 16, 1909, p. 146.)

The treatment of acute and subacute rheumatism, as advised in the text-books, and as usually carried out in practice, is inadequate and unsatisfactory. We must insist on the conception that rheumatism is a microbic toxemia, most virulent in early life, in which the heart is invariably affected to a greater or less extent, but the joints slightly and often not at all, and with the peculiarity that when it occurs in adults the most prominent symptom is often a painful arthritis. Improvement in treatment must be based on the specific action of sodium salicylate. To this must always be added sodium bicarbonate in an amount double that of the salicylate. The amount of each should be increased daily till unpleasant side effects are observed. Symptoms of acidosis in children may be prevented by keeping the urine alkaline with the soda, and preventing constipation. If unpleasant symptoms occur the salicylate should be omitted for a few hours. Initial doses for children are 100 grains daily for a child between seven and twelve years and 50 grains for a child younger than seven years. It may be necessary to increase the dose to 150 to 400 grains daily. The use of the ice bag is a valuable additional measure in case of inflammation of the heart. A. W. BINGHAM.

TIBONE, D.: TREATMENT OF SCLEREMA NEONATORUM. (*Riv. d' Clin. Ped.*, November, 1908.)

The author reviews at length many forms of treatment recently proposed for sclerema, all more or less ineffective except in a very small percentage of cases. He then describes his own plan of treatment suggested by the experiments of Langer and Knopfelmacher. The limbs that begin to show signs of alteration are each separately covered with a layer of absorbent cotton about 1 cm. thick. This is in turn entirely enclosed by rubber tissue or oiled silk kept in place by an ordinary gauze bandage. A report of 19 cases follows, of which 7 completely recovered and 4 were much improved.

The object of this treatment is. (1) To prevent radiation of heat; (2) to increase temperature of the limb; (3) to fluidify subcutaneous fat; (4) to revive capillary circulation.

C. D. MARTINETTI.

INFANT FEEDING.

PAUCOT: THE INFLUENCE OF MATERNAL REST ON THE WEIGHT OF THE FETUS AND THE DURATION OF PREGNANCY. (*L'Echo Médical du Nord,* May 10, 1908, p. 225.)

A plea for the better care of pregnant women in the later months on the part of public institutions, especially as a means of improving the condition of the newly born.

It is very clearly shown by a series of observations that a rest of at least two weeks before delivery invariably results in a marked increase of weight in the child. Dr. Bachimont has shown that a woman who has rested for two months before confinement will give birth to a child about 341 grams heavier than that of the woman who has worked up to the last moment. Finally, the effect of rest in prolonging the pregnancy to term is fully demonstrated. M. NICOLL, JR.

BOOK REVIEWS.

The International Medical Annual: A Year-Book of Treatment and Practitioner's Index. By Thirty-Eight Contributors. Twenty-seventh year. Pages ix+683. Illustrated. Price, $3.50. New York: E. B. Treat & Co., 1909.

The twenty-seventh issue of this Annual is, like its predecessors, carefully prepared, well made and illustrated. It contains, as usual, reviews of the therapeutic, the medical, and the surgical progress of the year 1908, a dictionary of remedies and many special articles on therapeutics and sanitation. It contains excellent articles on Serum Therapy, on Animal Therapy, on Opsonins and Vaccines, on Radiotherapeutics and Electrotherapeutics and on the Modern Treatment of Fractures. To the pediatrist the articles on Albuminuria in Children by Dr. Frederic E. Sondern, on Epidemic Cerebrospinal Meningitis by Dr. L. E. La Fétra, and the various articles on the Medical Diseases of Children by Dr. George F. Still are of especial interest. Many articles, notably those on the eye, on the nasal cavities, on gastroscopy, and on cranial surgery are beautifully illustrated, often by colored plates. The Index is quite complete and the book makes an attractive and useful whole.

The Psychical Evolution of the Infant. By Dr. Henri Bouquet. Pages iv+100 and index. Bloud & Cie, publishers, Paris, 1909.

This little monograph gives the personal experience of the author in regard to the development of the mentality during the first years of life. From the moment of birth the infant's mental growth is analyzed, and the appearance of each of the senses, and the ability to walk, speak, to imitate and to remember considered as each relates to the growth of the mind. The book is interesting from the point of view of the physician, the psychologist and the parent.

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ORIGINAL COMMUNICATIONS.

ACUTE POLIOMYELITIS (AN EPIDEMIC).*

BY HENRY KOPLIK, M.D.,

New York.

The epidemic of so-called poliomyelitis, which visited New York last summer, was certainly not only the most extensive known in New York, but possibly in the United States. Something over 1,200 cases were reported to the New York City and State Boards of Health. The conditions of weather and of atmosphere were not unusual, and the writer of this reference was present in New York during the whole epidemic, and his experience includes a large number of cases seen in private office work and with other physicians. The disease was certainly, in its characteristics, an epidemic one. It was quite widely distributed, being limited particularly to the city limits, with a few scattering cases in the suburbs. It cannot be said that to any extent the cases occurred in the filthy or crowded portions of the city; I have heard of cases in Tuxedo, a fashionable suburb for city residents. There were cases in parts of Brooklyn in sparsely populated districts; cases in the Bronx, where the sanitary conditions among the poor are exceptionally good; and finally, I saw cases in the crowded and filthy portions of the city. The conditions of the streets were not unusual; they were about as clean as one can expect to find in a large, densely populated city. There was nothing in the water supply that attracted attention, and the milk supply was certainly as good, if not better, than in previous summers. Therefore, so far as external hygienic influences are concerned, the conditions were not better, and certainly not worse, than they have been in previous years; consequently, the local conditions causing the epidemic must remain a matter of speculation.

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* Read before the Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 25, 1908.

The epidemic, in its behavior and in the several cases seen by me, certainly resembled very closely what was seen by Harbitz in Sweden, and so classically described by him in his work on the pathological aspect of this question. As to the character of the disease, it affected children of all ages from earliest infancy to adolescence; and some cases occurred in adults, but they were few and scattering.

The general characteristics of the disease can in no way be said to resemble what has been classically understood to be poliomyelitis anterior, but it is rather a disease which hitherto has been unknown to us in many of its manifestations. Many of these cases at first resembled meningitis, and yet some of the physicians with whom I came in contact saw immediately that they were in the presence of something new, which was not meningitis, and at the same time in some cases presented many meningeal symptoms.

I think it will be best from a clinical standpoint to describe certain sets of cases which occurred in this epidemic of so-called poliomyelitis. First, there were the cerebral cases. In these cases a child in apparent health would either suddenly go into a condition of unconsciousness, or would go to bed perfectly well, awake with a febrile movement, vomiting and complaining of headache, then pass into a condition of sopor, or with a very bright sensorium would develop paralysis of all four extremities. If the case was an extreme one, the paralysis would suddenly be followed by increasing sopor, in which the patient suddenly developed symptoms referable to the bulb or enlargement of the medulla; there was difficulty in respiration due to paresis or paralysis of the respiratory muscles; difficulty in swallowing; the sopor increased to coma with increasing paralysis in some cases ending with the death of the patient apparently from respiratory failure and bulbar paralysis. In other cases these cerebral symptoms would abate and a mild condition of sopor would be replaced by a clear sensorium, but with complete paralysis of all four extremities. In some cases there would also be paralysis of the abdominal muscles, or paralysis of the thoracic muscles and abdominal muscles, and muscles of the back, in addition to the muscles of the four extremities. These patients would also show distinct signs of bulbar paralysis with a form of breathing which is purely diaphragmatic, that is, the abdomen at each respiration would be protruded, the thorax remaining inert.

In other cases a child would go to bed apparently well, and these are what I call the neuritic cases; they would awake with acute pains in the extremities, referred in many cases to the joints. So acute were these pains that the patients would cry out in the night, even if not disturbed. Gradually, in many of these cases, a paralysis of one or all of the extremities would develop with a clear sensorium. In these cases also, as in the first set of cases, there was a mild febrile movement. The temperature, which at first was quite high, would drop to near the normal or normal and stay at the normal or continue for a time with slight variations above the normal. These cases were often mistaken for rheumatism. In some, after having lasted for three or four weeks, the pains would subside and leave a paralysis either of both extremities, or one upper or one lower extremity, and in other cases there was nothing left to show that the patient had been completely paralyzed but a slight facial paralysis. Some of these cases, after having been watched through a course of months, certainly impressed one as similar to those mentioned by Harbitz and Strümpell as occurring in these epidemics, and I believe that many of these cases were purely neuritic. On no other ground can I explain the almost complete recovery of many of these cases; cases which were completely paralyzed for weeks, which suffered intense agony from neuritic pains would, after two or three months, walk into my office with nothing to show of the serious illness through which they had passed but a slight paralysis, possibly of the peronei muscles as evinced by a slight halt in the gait.

The third set of cases were those which we are accustomed to see at times in which there is no epidemic. Cases which correspond minutely to what has been described by Charcot and his pupils as acute poliomyelitis anterior. That is, a patient would go to bed completely well and awake with a paralysis of one or two extremities, varying as the case may be; or a paralysis of a little group of muscles, either in the arm, forearm, thigh, leg or face. Many of these cases of anterior poliomyelitis acted very much as the text-books tell us they ought; a slight disturbance of the stomach, a febrile movement which lasted for a day or so, to be followed by paralysis.

We have therefore three distinct sets of cases—the cerebral, the neuritic with paralysis, and the classical cases of anterior poliomyelitis. It is hard to say at this period whether the pathology of all of these cases was similar. It is certainly safe to say that they were all the victims of some infectious agent. The cerebral cases, of which some were fatal, were autopsied, two of them in my hospital service, which was then under the care of Dr. Henry Heiman. The pathological appearances, gross and microscopical, were identical in these fatal cases with what has been described by Harbitz. Some of these cerebral cases were punctured in the hope that something might be discovered in the cerebrospinal fluid which would give a clue to the affection. Some of the punctures were warranted by the presence of the cerebral symptoms simulating as they did very closely meningitis. Nothing was found but a polynuclear cytosis. No bacteria were found by culture.

I will not describe the appearances so beautifully related by Harbitz in his work, but anyone who is acquainted with the relation of these appearances must admit that they give us an entirely different picture from what was formerly described as characteristic of anterior poliomyelitis. The areas of softening and hemorrhages to be found in the brain and cord are certainly not characteristic of anterior poliomyelitis, so that the term "poliomyelitis" must be accepted as a temporary nomenclature when applied to these epidemic cases. It certainly does not give us any idea of the characteristic lesions in the epidemic fatal cases.

I assume that the pathology is known as described by Harbitz and will not dwell any longer on this part of my theme.

Speaking of the cerebral cases, the form of paralysis was certainly peculiar. If the patient was not unconscious the sensorium was clear, and still the patients were unable to lift the extremities or to help themselves. They seemed to lie as if in a trance, and this in the presence of an absolutely normal temperature, or very little above the normal. The neuritic cases, however, were peculiar in that they not only had pain in the extremities and joints, especially at night, but there was great hyperesthesia; the little ones cried out in protest whenever examinations were made. They were perfectly helpless at the time that these pains existed. They could not sit up and had to be carried. The recovery in many of these cases was so complete that the conclusion is inevitable that no lasting infection of the cord occurred, but rather that the affection was limited to the nerve trunks.

As to the reflexes: It is well known that the reflexes in anterior poliomyelitis, as we understand it, are absent. In the vast majority of these neuritic cases the reflexes were increased at the knee, and in some cases which resembled anterior poliomyelitis as we classically know it, the reflexes were present and not absent. In the cerebral cases the reflexes were obtained, but there was no Kernig sign nor Babinsky reflexes.

What was especially astonishing in this epidemic was the rapid atrophy of muscle in those cases in which the paralysis was to remain permanent and the quick development within a week of the onset of the reactions of degeneration, and what was more startling, the contractures which occurred following very quickly the rapid atrophy of the muscle. In my own service, one case, which is still in the service, is impressive. This child developed the atrophy after being paralyzed in all four extremities; in the arms, forearms and muscles of the hand to such an extent as to give us the classical picture within a very short period, two or three weeks, of Duchenne's paralysis. The lower extremities showed the rapid atrophy of the muscles.

As to recovery: I have mentioned those cases in which a complete paralysis of all four extremities was followed by as rapid a recovery of power, so as to leave but very little evidence of paralysis. This fortunate ending was not uncommon in some cases, and as I have intimated, it was especially evident in the neuritic cases. Other cases which presented a picture of anterior poliomyelitis with absolute paralysis and atrophy of the muscles, of one lower extremity, for example, made an absolute and complete recovery to an extent which is only occasionally seen with the sporadic form of the disease; that is, the recovery included all the muscles of the extremity, excepting an isolated group such as the peronei, and even in this group only certain muscles were affected, so that the child within a few weeks recovered the use of a limb which had been absolutely paralyzed with very little atrophy to show that the affection had been present.

Some of the cases which had been completely paralyzed in all four extremities recovered so that they could walk, but the upper extremities remained absolutely paralyzed with the exception possibly of the power to lift the arms and forearms to a slight extent, with marked contractures. If a case recovered after having been paralyzed in all four extremities the Achilles muscles were very sharply contracted and demanded tenotomy within two months after the onset of the affection. After tenotomy was performed the patient was able to get about, of course showing paralysis in other groups of muscles in the lower extremities.

At the Hospital for Deformities in New York there have been a series of cases of facial paralysis treated, which was the only evidence in this epidemic of the disease after the onset of fever and gastric disturbance. Many of these cases were mistaken for meningitis of a tuberculous variety, the temperature being low or normal. One such case I saw in my office that had been thus diagnosed, the child being otherwise perfectly normal, the fundus of the eye being normal, the ears also being normal, subsequent events proving the correctness of the diagnosis, inasmuch as the case I am speaking of made a complete recovery so far as the facial paralysis is concerned. In this case there was a slight concomitant paralysis of the deltoid, which improved.

As to the causation and the mode by which the infectious agent enters the system, I have two theories to offer. In the vast majority of the cases I have seen, and in fully 60 per cent. of those seen by Gibney in the Ruptured and Crippled Hospital, there was a history of some disturbance of the intestine. In many of my cases there was a distinct history of diarrhea, in others constipation. In another set of cases, especially those with neuritis, I found that there had been a distinct attack of tonsillitis, and in several of these cases a culture had actually been taken of the throat, and nothing found but streptococcus infection, so that I believe that through the tonsils and through the gut an infectious agent must have reached the general nervous system.

Our nomenclature of this disease will certainly have to be revised. We can scarcely now speak of this disease as poliomyelitis, nor can we exclude from this epidemic the cases which I have mentioned, which resembled very closely the classical cases of anterior poliomyelitis and the classical cases of acute infectious neuritis. In other words, here we have a new infectious agent which is capable of causing paralytic disturbances, even death, by affecting the gray matter not only of the cerebrum, the medulla and the thorax, but also the white matter and axis cylinder of the nerve trunks.

As to the prevalence of the cases which have passed through this epidemic and retained their paralysis and disabilities to any degree, it is certainly sad to see how many children have been incapacitated by this epidemic. In one small institution, the Hospital for Deformities, there are not less than 150 odd cases coming for constant treatment, cases which show all varieties of paralysis and contractures and disabilities. The treatment which has been pursued, and which seems to give as much aid to nature as possible in these cases, has been that so much pursued in other forms of neuritis. Hot baths have given a great deal of comfort to the little ones, varied by massage of the extremities. Electricity at first seemed rather to aggravate the symptoms, especially in those cases in which there was pain along the nerves, but subsequently, after the acute symptoms had subsided, the electricity in the form of the rapid alternating current seemed to help to tone up the muscular apparatus.

In cases of complete paralysis I found that empirically I followed the old treatment in vogue at the time Charcot first described the affection; the intramuscular injection of strychnin was given to most of the cases with complete paralysis, one injection a day in the heart of the group of muscles affected. Whether this was of any utility it is difficult to say; but many of the cases treated thus made a good recovery. Cupping along the spine was tried in many of my cases as a matter of routine. I cannot say that any treatment did good except that directed toward the alleviation of the pain, and for this I found the antirheumatic remedies of the coal tar series, such as aspirin, of decided utility.

EARLY SYMPTOMS IN SIXTY-THREE CASES OF THE RECENT EPIDEMIC OF ANTERIOR POLIOMYELITIS.*

BY L. E. LA FÉTRA, M.D.,
New York.

The ordinary conception of anterior poliomyelitis is that of a disease which begins with vomiting, fever and more or less general nervous irritability, occasionally convulsions and delirium. Within one or two days there is paralysis in one or more of the extremities. The text-book descriptions would make the diagnosis very simple because of the early appearance of paralysis and because of the lack of marked cerebral or nervous symptoms and the absence of pain, tenderness or of rigidity in the extremities.

The recent epidemic in New York and vicinity has furnished an opportunity to observe many cases whose symptoms do not agree with the ordinary conception of the disease and has therefore offered many a difficult problem in diagnosis. On this account it has seemed worth while to the writer to make a study of the early symptoms of 63 cases of the disease; of these 20 were under treatment at the Babies' Hospital, 40 were observed at the Children's Department of the Vanderbilt Clinic and 3 were private patients.

The *conditions preceding the onset* of the disease were not sufficiently uniform in any number of cases to justify any conclusion. Some of the suggestive histories are as follows:

Of the Babies' Hospital cases:—

Henry S., two and a half years old. Was taken for a long drive. Came home very tired. Had fever that night and for six days following. Was paralyzed in both extremities on the morning following the drive.

Arthur D., three and one-half years old. Had been vomiting every day from August 24th until September 1st. Was not considered ill although he had fever from 99° to 101° F.

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* Read at the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 25, 1908.

On the eighth day he was found to be paralyzed in both lower extremities.

Edmund J., three years old. Was in good health, the first symptom being severe occipital pain. This lasted for five days and was accompanied by slight fever. Then it was noticed that he had a general weakness and was unable to stand although he could move the lower extremities.

Rose J., nineteen months old. Perfectly well, and had no vomiting, but fever and restlessness for one day when paralysis was noted in both upper and lower extremities. The fever continued for two days after the appearance of paralysis. There was in this case some rigidity of the neck, but no pain in the paralyzed limbs, the paralysis being flaccid. (This type of case where the patient was in apparent perfect health and was suddenly taken with fever and paralysis was very common throughout the series.)

Arthur F., two and one-quarter years old. Swallowed a penny on September 18th. Was given an active purgative. That night there was fever and drowsiness and weakness of the extremities was noticed. On successive days the legs were paralyzed, the arms were very weak, and finally on the third day showed distinct paralysis.

John L., one year old. Had a cough and low fever for one week; then one morning paralysis was found in both lower extremities. There had been vomiting at the onset.

Sadie B., two years old. Was in apparently perfect health until she fell from bed. Walked a little for the next two days, but on the third day was unable to walk and it was found that she had paralysis of the left arm and leg.

Charles W., thirteen months old. Was apparently well until he fell from a low chair. When picked up it was found that the whole left upper extremity was paralyzed.

Among the Vanderbilt Clinic histories the following were noteworthy:—

Rachel F., thirteen months old. Was apathetic and somnolent for one week; was then in a stupor for forty-eight hours; then she became irritable and had an attack of vomiting with fever. There was rigidity of the neck, and on the day after vomiting it was found that both upper and both lower extremities and the left side of the face were paralyzed. There were pains in the limbs early, along the peripheral nerves, in the muscles and apparently also in the joints. Both legs and arms were said to be swollen. The case terminated in complete functional recovery, except in the left arm, forearms and left side of face.

George C., one and one-half years old. Had a high fever up to 105°F., lasting one week, but without any initial vomiting. There was restlessness and delirium. Four days after onset the arms were paralyzed; next the muscles of the back and finally the legs, all within the first week. The muscles of the abdomen were next affected so that the abdomen was distended. There was no pain or tenderness in the limbs and no rigidity of the neck.

Ralph C., two and one-half years old. Had cough and fever for three days. He kept complaining of pain in the left leg and a sensation of prickling. The paralysis was flaccid and recovery complete.

Eleanor B., six and one-half years old. Felt pain in back of neck on Saturday. On Sunday she walked with difficulty and had a temperature of 101°-102° F. On Monday she could not walk at all because of paralysis in left foot and leg.

David S., three years old. Had fever, pain and rigidity of the back and of the neck. The next day there was paralysis of both legs. For two days he was unable to urinate and there was constipation for three days. There was general painfulness of limbs, including the joints and the muscles.

Nellie S., ten months old. A nursing baby. Had fever, slight vomiting, convulsions and coma. Paralysis appeared two days after onset. For two weeks it was necessary to catheterize the baby. There was paralysis of both upper extremities and of both legs.

Ethel H., six years old. Had been trolley riding and had eaten various kinds of refreshments. That evening she vomited and had high fever. In twenty-four hours there was rigid paralysis of the left thigh, leg and foot. Both legs were painful, the muscles of the left leg being especially so. There was no rigidity of the neck.

Among the 3 private cases 2 are worthy of mention:—

Baby T., a little girl ten months old. She had a disordered digestion with fever up to 101°F., vomiting and great restlessness. In four days she had gradually sunk into a stupor which lasted for three days. She could be roused, but lay very still. The temperature after onset was not over $102\frac{2}{5}$°F. Her pulse and respiration were irregular, the latter suggesting Cheyne-Stokes. The fontanel was not bulging, there was no Kernig's sign, and the extremities were flaccid; reflexes normal. On account of the stupor and the irregularity of pulse and respiration, the question of tuberculous meningitis arose, but because of the lack of rigidity of the neck or bulging of the fontanel it was decided to wait a few days before making lumbar puncture. Paralysis of both legs and of the right arm developed in four days and the baby's mind became clear at about the same time.

S. E. J., nine-year-old boy. On September 22d, after a very good summer at Lake George, the boy returned to New York. Had examination at school the following day and went to school on September 25th. On September 26th, after playing in the park for an hour and a half, he became tired and sat on a large stone watching a fire for about an hour. When he went home he was quite tired but seemingly well. That night he was very restless and complained of pain in stomach, although nothing unusual had been eaten. The next morning, September 27th, he had some headache, pain in both eyes, and slight aching throughout body. The right eye was red and there was some lacrymation. His temperature was found to be 101°F., and there was a little redness of the throat. He was kept in bed all day and had a good sleep that night. The next day, September 28th, he felt well so that he went to the country for over Sunday, taking a railroad trip of four hours. He returned to town on September 30th and seemed well the next day, so that he went to school (October 1st). At noon, when his mother went for him, he complained that he could not walk home because he had such a stomachache and because his eyes pained him on coming out into the light. He walked half a dozen blocks and then began to cry because of pain in the eyes. He sat down on a bench and his hands and feet became cold, although he did not have real chill. After coming home in the street car he went to bed and did not care for any luncheon. When seen by me at five o'clock he had intense headache, photophobia, pain on movement of the eyes and pain on movement of the limbs. The temperature was 101°F., later mounting to 102°F. The tendon reflexes were all tested at this time without any changes being noted. There was no nausea nor vomiting during the night, but he complained bitterly of pain, mostly in the head. The next afternoon the symptoms were exaggerated, and there was, in addition, pain in the back and neck and stiffness of the neck. Dr. Holt saw the boy in consultation that evening. Complete examination failed to give definite diagnosis. The next day the pain and rigidity in back of the neck were increased, and he was unable to walk, although there was no paralysis. There was, however, an increase of the pain in the extremities. The next day, October 2d, the temperature rose to 103°F. The painful rigidity of the limbs was marked. Dr. Holt saw the patient, and at this time 15 c.c. of clear fluid were drawn by lumbar puncture. The fluid was negative on examination. On October 5th the urine had to be drawn with a catheter, and this was necessary for three days. The rigidity and pain in the back of the neck lasted for nine days. The child developed partial paralysis of both upper and both lower extremities. Painful cramps in the arms and legs were a marked feature and the pain in the legs persisted for three and one-half weeks. The legs were held drawn up and flexed at the knees for two and one-half weeks. After the third week rapid improvement took place. The child spent the winter in Bermuda and has recently returned to New York able to walk without a crutch or brace. There is still some dragging of the right foot.

The peculiar features of this case were: First, the intermission at the onset, there being three days of apparent perfect health after probably what was the beginning of the disease. Second, the intense headache, photophobia, rigidity of the neck, and the peculiar cramping pains and tenderness of all the extremities. Third, the slow appearance of the paralysis.

The details of the more important early symptoms in the 63 cases are as follows:—

Vomiting.—This occurred in 25 cases. In 1 it lasted for six days. As a rule, it occurred only at the time of onset.

Constipation.—This was present in 14 cases; therefore not at all characteristic.

Diarrhea.—This occurred in 17 cases. It was severe, lasting for a week or more in 4 cases. In regard to this symptom it should be emphasized that the cases occurred during the mid-summer, and that most of the patients that suffered from diarrhea were young children or infants. It does not seem significant.

Cough, tonsillitis or sore throat existed in only 6 cases.

Fever was noted as present in 52 of the cases. It was probably present in all. The range of the temperature was from 100°-102° F. in the milder cases and 101°-105° F. in the more severe. It lasted generally from two to three days, but in some cases more than a week.

Restlessness and Irritability were very common in this epidemic, being definitely noted as present in 37 of the cases. In 3 cases there was general hyperesthesia.

Delirium was present in only 2 of the cases.

Convulsions were present in 4 cases, being severe in only 1, and in that case being repeated for four times only through one day.

Rigidity of the Neck.—This was present in 11 cases; it was exceedingly painful and persisted for over a week in 1 case.

Tendon Reflexes.—So few cases were seen before the time of paralysis that the study of the reflexes at the onset was impossible. Of the 20 cases seen at the Babies' Hospital the reflexes were absent in the paralyzed limbs in 16 cases, the reaction was present but sluggish in 3 cases, and in 1 case it was present on one side, absent on the other, the paralysis involving both lower extremities. In 2 cases the patellar reflex was absent on both sides, while the paralysis involved only one lower extremity. In those cases where the paralysis was rigid the reflexes were not obtainable and in no case of the whole series was the tendon reflex found to be exaggerated. Babinsky's sign was present in 3 of the Babies' Hospital cases, one of these being on the side opposite the paralysis.

Apathy was present in 10 cases. In all but one it occurred early in the disease.

Stupor was present in 4 cases, in one instance lasting for forty-eight hours and in another for three days.

Headache was noted as present in 10 cases, being general in 3, frontal in 5, in one of which it was very excruciating, and occipital in 2 cases.

Photophobia was definitely present in 3 cases.

Pain and tenderness in the affected limbs was present in 32 cases; also along the peripheral nerves in 2 cases, in the muscles in 5 cases, and on movement of the joints in 4 cases. This symptom should be emphasized, because it has rarely been noticed in sporadic cases and was an element in confusing the diagnosis with cerebrospinal meningitis and with neuritis.

Character of the Paralysis.—The paralyzed limb was flaccid in 58 cases, spastic or rigid in 5 cases.

The paralysis came on early in a large proportion of the cases; on the first day in 24 cases, on the second day in 9 cases, on the third day in 3 cases, and after two weeks or more in 4 cases.

Other Symptoms.—The left side of the face was involved in a case which had paralysis of both upper and both lower extremities. The muscles of both the back and abdomen were involved in 1 case. The muscles of the neck and of the larynx were involved in 1 case. The respiration and pulse were irregular in 1 case. There was partial paralysis of the bladder in 4 cases, a catheter being necessary for two to seven days in 2 of these cases. Opisthotonos existed for five days in 1 case and for ten days in another. There was general anesthesia in 1 case and hyperidrosis in 1 case. There were 2 cases of unilateral paralysis of the oblique abdominal muscles, resulting in one-sided bulging of the abdomen at the semilunar line.

Lumbar Puncture.—This was done in 14 cases, 13 of them being those at the Babies' Hospital. From 15 to 70 c.c. of fluid was removed. It was under no pressure in 4 cases, slight pressure in 5, and increased pressure in 5 cases. Fluid was clear in every instance and was negative for bacteria both by smear and culture. In only 1 case were any cells found, and in this instance there were a few mononuclears present.

Blood Examinations.—Counts of the white cells were made in only 6 of the cases, the number ranging from 13,400 to 20,600. In the severest case which terminated fatally, and in which the paralysis was very widespread, the white cells were 18,200.

The explanation of the irritative symptoms, such as pain, cramps, rigidity, photophobia, etc., is an interesting question. Harbitz and Scheele would explain these symptoms as due to the irritation of the peripheral nerves resulting from inflammation of the pia mater of the cord and brain, which they found in their studies. They believe that this infiltration of the pia always precedes the inflammation of the grey matter of the cord or of the cortex. They found no inflammation of the peripheral nerves.

The diagnosis of the disease in the beginning of the epidemic may be very difficult. This has been noted many times, the confusion with acute meningitis, as well as with multiple neuritis, being very easy when the irritative symptoms are pronounced. The liability of mistake in diagnosis was especially commented upon by Harbitz in his report of the Norway epidemic of 1903-1906. It was also noted by Caverley, by Mackenzie and by Chapin in their reports of epidemics in this country.

The careful studies that have come from Norway and Sweden in the last few years, particularly those of Medin, of Harbitz and Scheele, and recently of Wickman, have shed new light upon this disease and upon other nervous disorders closely related. Medin found, alongside typical cases of spinal poliomyelitis, cases of poliomyelitis of the bulb—pontine encephalitis—and also cases of local cerebral spastic paralysis due to encephalitis. The epidemic of 1905 showed also a meningitic, a polyneuritic and an abortive form in which there was no paralysis. Cases of progressive paralysis—ascending or descending—were also seen.

On account of the existence of these types of trouble in the same epidemic, and on account of their all having essentially the same pathological basis, Wickman has proposed to group them all under the name of the Heine-Medin Disease. This disease he would classify as appearing under eight different forms, as follows:—

(1) Ordinary spinal paralysis; anterior poliomyelitis. (2) Progressive paralysis, usually ascending, less often descending; Landry's paralysis. (3) Bulbar paralysis; polioencephalitis of pons. (4) Acute encephalitis, giving spastic mono, or hemiplegia. (5) Ataxic form. (6) Polyneuritis, multiple neuritic type. (7) Meningitic form. (8) Abortive.

I have not attempted to classify my cases under these types.

Although most writers mention the fact that cerebral symptoms, such as convulsions or stupor, may be present, and also that painful peripheral irritative symptoms may occur, still the medical profession at large needs to have these facts emphasized in the interest of early diagnosis and proper early treatment.

DISCUSSION OF PAPERS BY DRS. KOPLIK AND LA FÉTRA.

Dr. Holt.—In regard to the question of the epidemic I think something additional might be said. It is now being studied by a committee appointed by several of the societies, and according to the best information that the secretary has been able to get the number of cases in New York is not far from 3,000. If that is approximately correct, it is not only the largest epidemic of the United States, but of the world.

During the fall and summer I saw a good many cases in the neighborhood of New York City and should not agree with Dr. Koplik that it was limited to New York City, though it occurred in much larger numbers in the city districts.

A thing that struck me was the groups of cases occurring together. A physician, now a candidate for membership in this Society, came home with his two children and within ten days of his arrival in New York both children came down with symptoms of the disease. Both were paralyzed and both recovered completely. We had at the Babies' Hospital a child admitted from a small home in a neighboring village, and in seven days from that a second child came down who had been sleeping in the same bed with this one. In Pleasantville a child was taken ill on Saturday, and the following Saturday his little brother came down with an attack. I was furnished with a report of cases with five or six occurring in the same family, or separated by a four or five days' interval. One, a woman who went to visit a friend whose child was suffering with the disease and her boy was placed in the same crib; three days later this child came down with the disease and was paralyzed. These coincidences were so numerous that they make a very probable showing for a mild degree of contagiousness in this form of the disease. I think we must admit that this disease belongs in the category of acute infectious diseases of the central nervous system, with possibly a mild degree of contagiousness behind it.

One of the striking things was the number of cases that recovered, and completely. Another is the number that died. We have been accustomed to look upon poliomyelitis as a disease with no danger to life. We had 3 fatal cases in the Babies' Hospital. The total mortality was something like 12 per cent. When death occurs in the sporadic form it is probably ascribed to something else than poliomyelitis.

Another striking thing which occurred in the epidemic was that the disease stopped with the advent of the month of October. That has been the history of the epidemics everywhere—that they have ceased with the beginning of cold weather. Whether it will occur again in New York next year we do not of course know, but it has been the history of the disease that it has recurred in this way.

Now with reference to the punctures and the results. The fluids from the Babies' Hospital were sent to the Rockefeller Institute and studied by Dr. Flexner with negative results from every point of view. Dr. Flexner thought that the findings somewhat opposed the view that there was an acute microbic infection of the spinal cord and the results suggested rather a toxic degeneration of the cord due to toxines produced somewhere else in the body.

Obstinate constipation was a symptom of several cases I saw, like the obstipation we see in some forms of disease. I have seen lately 1 or 2 cases of polioencephalitis which ran a course very much like the familiar picture of poliomyelitis. The children came into the hospital with a history of convulsions and developed stupor, but we soon saw that it was not meningitis. There were mental symptoms: the temperature would rise to 104°F. and then drop to normal. They recovered completely. In spite of the location of the disease, its onset and febrile reaction were very similar to our spinal cases, except that the symptoms were entirely cerebral.

It suggests that we have a disease that is perhaps an acute inflammation of the central nervous system, which generally localizes its effects upon the anterior horns, but may affect the cerebrum without affecting the cord at all.

Dr. Jacobi.—I have only a few words to say. It has been suggested by Dr. Koplik that because the disease shows so many different forms it must be something absolutely new. I cannot agree with that. There are many different types of the disease that have been observed. I believe if we refer to the last remark made by Dr. Holt we have it all in a nutshell. It is a disease of the nervous system, perhaps not of the cord itself, but of the whole central nervous system. We do not know the cause, but we know one symptom that is common; that is hemorrhages—small hemorrhages. They have been found, not only in the anterior columns of the cord, but also in the posterior; and, not only in the cord, but in the brain. According to their localization they will produce a number of different symptoms. It is not necessary that small hemorrhages should give rise to any symptoms whatever, at least as far as sensation, motion and intellect are concerned. We know that we have hundreds of little hemorrhages in cases of concussion of the brain which get well. In those cases we are not astonished at all to find no symptoms. They get well without paralysis or disturbances of sensation or intellect. A large number of such localized small hemorrhages in poliomyelitis or polioencephalitis may produce no symptoms whatever and leave no symptoms. It depends on the location as to how temporary or how permanent the symptoms will be. It appears to me that the character of the disease this year in a large majority of cases is more that of polioencephalitis than poliomyelitis. That explains a number of symptoms that formerly were not very common. We should remember that where polioencephalitis is predominating there should be intact patella reflex. In the cases where the cord is affected the reflex disappears in a very short time and atrophy will set in very soon. If we remember what we knew formerly of poliomyelitis, and that this winter the epidemic was twenty times as extensive as the largest of those that had been observed anywhere and the cases a hundred times as numerous as occurred in many of the epidemics, we should hesitate a little in demanding the same symptoms that were observed at that time, in those cases, that it was our lot to see last year. I would fall back upon the old reports—those of Heine in 1840 and 1860. Most all of his cases were of a different description altogether. He reported cases of children put to bed well and taken up paralyzed; nothing the matter with them at night and in the morning paraplegia. A number of cases, however, were reported by him in which there was the occurrence of fever in the night and paralysis in the morning. There were other cases in which the babies were sick in bed with, for instance, scarlet fever or pneumonia, and when taken from the bed it was found that they were paralyzed. So there were a number of different types even then. These are the cases and types which I have often seen, and described these nearly fifty years. Therefore, we should not be so astonished to find in an epidemic that is a hundred times as large as those were that there should be a number of different symptoms. We should be satisfied in saying, as we do not know the etiology, that it is a disease striking the nervous system as a whole, more in this place or that, as the case may be. Cases of polioencephalitis have a greater tendency to get well completely than cases of poliomyelitis. The latter get better frequently; well, entirely well, quite rarely.

Dr. Abt.—Were there any autopsies on the fatal cases, and what were the findings?

Dr. Kerley.—I had an opportunity to see in this New York epidemic 43 cases: 13 in the Babies' Hospital, 9 in other institutions, 3 in my own practice and 18 in consultation. I came into these cases late in August and early in September. The cases increased until October and then practically ceased.

Dr. Koplik and Dr. La Fétra have given such an admirable exposition of the symptomatology that I have little to say. I thoroughly agree with what Dr. Koplik says. I have seen more or less poliomyelitis for twenty years and I think in this epidemic we have had an entirely new proposition. In some of the cases it was absolutely impossible to differentiate between them and cerebrospinal meningitis. The rapid onset, retraction of the neck, stupor, etc., was marked. Kernig's sign was ruled out in many of the cases because there was so much tenderness.

As to the territory of the epidemic, I found that the northern boundary was at Malden. There, with only twelve or fifteen children in the school, they had four with poliomyelitis. That would seem to be the apex of a triangle which extended down the river until it reached New York. The area was, as Dr. Holt has said, of very wide distribution.

One of the cases was particularly interesting to me: the child came down with acute symptoms of fever and vomiting and developed facial paralysis, the only evidence of paralysis that occurred and it persists at the present time. Evidently there was a nuclear involvement.

Dr. Morse.—I recently had occasion to analyze the cases of infantile paralysis which I had seen. Only three or four of them were seen last autumn. The results of this analysis, as will be seen, show that the type of the disease in the sporadic cases is essentially the same as during the recent epidemic in New York. Pain and tenderness were present in two-thirds of the cases, in some at the onset, in others beginning after two or three days; the duration was usually but a few days, but they sometimes persisted for a month. They were most often in the neck, but were sometimes general, usually in the affected portions. Tenderness over the nerve trunks, especially the sciatics, was not uncommon, and in some cases obscured the diagnosis.

Cerebral and meningeal symptoms were also common. In some, delirium and stupor persisted for several days. In 1 case stupor persisted for a week. Nervous irritability was also very marked in a number of cases. Headache was the first symptom in 1 case and persisted for several days. It preceded the paralysis and other symptoms by thirty-six hours. Rigidity, retraction and tenderness in the neck were not at all uncommon. They appeared, as a rule, on the second or third day, but were sometimes present at the onset. They usually disappeared after a few days, but sometimes lasted one or two weeks. The blood, during the acute stages, showed a leukocytosis.

Dr. Koplik (closing discussion).—As to the postmortem findings, in 2 fatal cases at the Mount Sinai Hospital there were autopsies, the findings of which will be published later. In a general way they corresponded closely to what has been described here this evening; areas of softening throughout the cortex; areas of hemorrhage throughout the cord, and areas of softening in the cord. The opinion of Harbitz was confirmed that the disease begins in the meninges and extends from there.

This disease does not affect any other nervous disease that may be in progress at the same time. I saw a case, just before leaving:

a child came to me in March with symptoms pointing to some general nervous trouble; he felt tired and did not feel like walking; when he sat down he did not care to get up. A positive diagnosis was not made at that time. The child went through the epidemic and developed poliomyelitis and came into my office with paralysis of right upper extremity and also with pseudohypertrophic paralysis fully developed. The course of this child's nervous affection, which was perhaps more serious than the poliomyelitis, was not affected by the latter, and the two nervous diseases existed side by side.

NERVOUSNESS IN CHILDREN IN RELATION TO THEIR FOOD.—The nervousness to which Siegert (*Münch. med. Woch.*) refers occurs in children in well-to-do families kept on what is supposed to be an extra-nourishing diet. When milk is given too exclusively, without vegetables, the child is flabby and anemic, with no appetite, but obstinate constipation. When eggs and milk form the main diet, there is often recurring catarrh of the large intestine, while children who eat too much meat display a tendency to skin affections with great elimination of urates and vulvitis. When milk, eggs and meat form almost the sole diet, the child looks sallow and miserable, with a tendency to itching eczema and recurring folliculitis, and restless sleep. In every case, without exception, the child suffers when there is lack of carbohydrates, alkali and cellulose in the diet, with predominance of albumin and fat, and when the total amount of food is inadequate. He says that he has seen about 60 examples of this "overfeeding nervousness" and relates a few cases. The children are restless day and night, tire easily, and suffer from frequent infections and obstinate constipation, all of which can be banished merely by regulating the diet, restricting the albumin and fat, while ordering vegetables, salads and fruit. He has never failed to discover this defective diet with this "dystrophic nervousness." In some cases high medical authorities had recommended the milk, egg, oatmeal and sugar diet, but without providing for any supply of salt. The recent announcements in regard to the advantages of an exclusive milk diet without salt, for reduction of obesity, confirm again the reasons for loss of appetite in children overfed with milk. He regards eggs as superfluous for children, except as used in preparation of puddings, etc. Vegetable soups, well salted, are important in the diet, with fruit for dessert, cooked for supper.—*Woman's Medical Journal.*

THE OCCURRENCE OF PEPSIN IN THE INFANT STOMACH, AND THE DEPENDENCE OF ITS DIGESTIVE POWER UPON THE PRESENCE OF HYDROCHLORIC ACID.*

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That the stomach of the newborn infant contains pepsin has already been demonstrated by a number of authors. Zweifel[1] and Hammarsten[2] were able to demonstrate that from the stomach of the infant (postmortem) active pepsin could be extracted. Leo[3] and Van Puteren[4] were able to demonstrate peptone in the stomach contents of newborn infants soon after milk feeding. Toch[5] was able to show the presence of peptone in the stomach contents of breast babies which was removed by tube one-half to one hour after nursing. He was able to digest fibrin-flakes with the gastric juice when first he added 0.3 per cent. HCl and allowed the same to stand in the incubator for ten hours at a temperature of 38° C.

Concerning the secretion of hydrochloric and lactic acids, and their relation to the digestive process in the newborn, many investigations have been made. Among the investigators are Heubner[6], Leo[7], Van Puteren[8], Jaksch[9], Einhorn[10], Cassel[11], and Wohlmann[12]. The findings of the different authors do not by any means agree. Heubner in twenty-three examinations of the stomach contents of infants from nine weeks to eleven months, found five times definite amounts of HCl; nine times very indefinite amounts, and in ten cases there was not a trace of HCl found. Wohlmann, on the other hand, found HCl constant in the stomach of the healthy infant after the taking of food.

Concerning the foregoing experiments, Czerny-Keller[13] made the following comments: "Because of the slight HCl production of the stomach of the infant, and the hydrochloric acid binding properties of the milk salts, it is not to be accepted without further proof that the peptone found in the stomach contents resulted from the digestion by the pepsin. These investigations prove indeed the presence of pepsin, but not its digestive activity in the infant's stomach. For the proof of this, further investigations must be made."

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* Published in German in August number of the Jahrbuch für Kinderheilkunde.

With a hope of solving some of these unsettled problems, the following series of examinations were undertaken in the Heubner Clinic in Berlin.

Forty-seven examinations of gastric juice were made from infants varying in age from eleven days to ten months. They were all infants admitted to the Kinder-Klinik of the Charité.

The number comprises a series of atrophic infants on whom metabolism experiments were being made, and also a number of normal breast infants whose mothers served in the hospital in the capacity of wet-nurse. Most of the cases were examined several times with a view of determining the constancy of the individual findings.

The method of procedure was as follows, and was exactly the same in all cases. After the infant had fasted during the night, it was given, the first thing in the morning, a bottle of weak Russian tea, without sugar, and after one hour the stomach contents were removed by the introduction of a tube. For determining the presence or absence of pepsin, I made use of the edestin test of Fuld and Levison[13], which is described briefly as follows:

An HCl solution with an acidity of 30 (an amount corresponding to the free HCl found normally after a test meal) is prepared in the following way: To 97 c.cm. distilled water is added 3 c.cm. normal HCl, or to 70 c.cm. distilled water, 30 c.cm., one-tenth normal HCl. This standard solution is to be used in all the tests for all dilutions.

By means of this HCl solution, a 1:1000 edestin solution is prepared. To prevent the solution from decomposing, it is recommended that it be boiled, which procedure does not in any way injure it. The filtrate of the gastric juice to be examined is then twenty times diluted (for infants I diluted it ten or five times). To each of a series of dry uniform test tubes is added an increasing amount of the diluted gastric juice, and rapidly 2 c.cm. of the 1:1000 edestin solution. After allowing the tubes to stand at a temperature of about 37°C. for thirty minutes, sodium chloride in substance is added to each of the test tubes, and after shaking each to facilitate the mixing, it is noted in which of the tubes cloudiness appears. One observes the one poorest in pepsin without cloudiness, and reckons therefrom the strength of the gastric juice. This is estimated in the following manner: "When from a ten times dilution of the gastric juice, 0.25 c.cm. is required to prevent a cloudiness appearing in 2 c.cm. edestin solution, it is so expressed, 0.25 : 10.2 or 1 :80, one reckons therefore gastric juice as containing pepsin in the strength of 1 :80, or the stomach contents is said to be 80 strong."

For the following tests six tubes were used; the stomach contents diluted ten times or often only five times. Of this diluted gastric juice, the following amounts were added to the test tubes, 0.1-0.25-0.40-0.64-1.0 c.cm., and to each was hurriedly added 2 c.cm. of the prepared 1 :1000 edestin solution. The tubes were then placed in the incubator for thirty minutes at 37° C., at the

TABLE I.

NORMAL BREAST INFANTS.

Name and Age of Infant.	Date of Admission and Weight	Date of Examination and Weight	Diagnosis	Stool	Amount of Gastric Juice in c.cm.	Reaction to Litmus Paper	Reaction to Congo Paper and Günzburg	Reaction to Uffelmann's Reagent	Dilution of Gastric Juice	Pepsin Value	Time of Test—hrs.	Remarks
Ernest L. 11 days	XI. 23 3040	XI. 26 3100	Healthy	Normal	10	Neutral	Negative	Negative	5 times	10	½	This infant vomited many times daily since birth
" 8 weeks	"	3420	Vomiting	"	22	"	"	"	"	40	½	
" 10 "		3550	"	"	20	Acid	"	Positive	"	40	½	
Otto J. 3 months	IX. 12 2000	XI. 29 3950	Healthy	Normal	10	Acid	Positive	Trace	5 times	10	½	
" 3½ "	"	XII. 14 4300	"	"	15	"	Trace	Positive	"	30	½	
" 3½ "	"	XII. 16 4325	"	"	7	"	Negative	"	"	30	½	
" 4½ "	"	I. 15 4900	"	"	12	Neutral	"	Negative	"	40	½	
Paul La K. 14 weeks	IX. 7 3280	XII. 7 4960	Healthy	Normal	7	Acid	Positive	Negative	5 times	10	½	
" 18 "	"	I. 7 5070	"	"	20	"	"	"	"	40	½	
Walter J. 15 weeks	IX. 14 3580	XII. 31 4780	Healthy	Normal	2	Acid	Positive	Negative	5 times	30	½	
" 17 "	"	I. 13 4850	"	"	5	"	"	"	"	40	½	
" 17½ "	"	I. 18 4875	"	"	20	Acid	Trace	Positive	"	30	½	
Bruno, M. 14 weeks	XI. 2 3880	I. 22 4810	Healthy	Normal	12	Acid	Negative	"	5 times	40	½	

end of which time they were removed, and to each was added a quantity of sodium chloride, so that after shaking the tube several times some salt still remained undissolved.

I reckoned those as positive (containing pepsin) which remained without cloudiness after the above described procedure. As most of the cases were examined several times, the combined results of the individuals have been placed together.

An analysis of the foregoing table will show that 5 cases were examined, and from these 5 cases thirteen examinations of gastric juice were made. All the examinations gave a positive test for pepsin.

The reaction of the gastric juice was

10 times acid.
3 times neutral.
Hydrochloric acid, 7 times positive.
" " 6 " negative.
Lactic acid, 6 " positive.
" " 7 " negative.

Hydrochloric and lactic acid occurred together in 3 cases, and in these cases the lactic acid predominated.

The findings concerning the HCl are not in accord with those of Leo, Van Puteren and Wohlmann, who found in the stomachs of healthy breast infants HCl constantly present in from one-half to two hours after the partaking of milk. Wohlmann found, however, that after tea or albumin water no HCl appeared in the gastric juice. The findings of Heubner do not agree with the authors mentioned. Of 10 negative cases in Heubner's series, 5 were normal breast infants. These examinations were all made after milk test meals. Since in my cases the gastric contents were withdrawn never later than one hour after the test meal of tea, it is probable that HCl would have been present in a greater number of cases had it been possible to wait longer before withdrawing the stomach contents. This, however, was not practical since the stomach was sometimes quite empty after waiting one hour.

From the foregoing series of experiments it has been conclusively demonstrated that the stomach of the normal breast infant contains pepsin. That pepsin is frequently to be demonstrated in the stomach of the not normal, artificially-fed infant, will be shown by the following series of experiments.

TABLE II.

NOT-NORMAL INFANTS.

Name and Age of Infant	Date of Admission and Weight	Date of Examination and Weight	Diagnosis	Stool	Amount of Gastric Juice in c.cm.	Reaction to Litmus Paper	Reaction to Congo Paper and Günzburg	Reaction to Uffelmann's Reagent	Dilution of Gastric Juice	Pepsin Value	Time of Test—hrs.	Remarks
Hugo Rosemi 41 days	X. 14 2325	XII. 9 2345	Atrophy	Normal	5½	Acid	Negative	Trace	10 times	0	½	Undiluted gastric juice; also negative after 1 hr.
" 44 "	"	XI. 14 2345	"	"	20	Neutral	"	Negative	"	0	½	
" 51 "	"	XI. 21 2360	"	"	3	Acid	Positive	"	"	0	½	"
" 75 "	"	XII. 17 2740	"	"	8	"	"	"	"	10	½	
Lillie Thomas 8½ months	XI. 11 4625	XI. 22 4650	Atrophy	Normal	5	Neutral	Negative	Negative	5 times	0	½	Undiluted gastric juice; also negative
Ella Nilke 3 months	X. 5 2850	XI. 23 2670	Atrophy	Normal	5	Acid	Positive	Negative	10 times	20	1	—
" 15 weeks	"	XII. 13 2950	"	"	2	"	"	Trace	5 times	12	½	
Walter Katt 4 months	X. 10 2850	XII. 5 2400	Lues? Atrophy	Normal	5	Alkaline	Negative	Negative	5 times	0	1	Undiluted gastric juice; also negative
" 4½ "	"	XII. 20 2380	"	"	5	"	"	"	"	0	1	
Erna Engel 4½ months	IX. 9 2290	XII. 19 2275	Atrophy Lues?	Normal	3	Neutral	Negative	Negative	"	0	1	"
Earnest R. 6 weeks	X. 14 3185	XI. 29 2385	Pemphigus Atrophy	Small Much Mucus	6	Neutral	Negative	Negative	5 times	0	1	Undiluted gastric juice; also negative
" 2 months	"	XII. 12 2510	"	Normal	8	"	"	"	"	0	1	
Bertha M. ½ month	X. 25 2600	XI. 29 2600	Hydrocephalus Atrophy	Normal	3	Alkaline	Negative	Negative	5 times	0	1	"
Hans W. 3½ months	X. 30 4020	XI. 18 3970	Atrophy	Normal	7	Neutral	Negative	Negative	5 times	0	1	"
Max Finster 4 months	XI. 14 3750	XI. 19 4135	Acute Dyspepsia	Green & Watery	21	Neutral	Negative	Negative	5 times	0	1	—
" 4½ "	"	XI. 25 4000	"	Normal	2	"	"	"	"	20	½	
Richard G. 16 weeks	XI. 4 3950	XI. 25 3780	Dyspepsia	Muculent	3	Neutral	Negative	Negative	10 times	20	½	—
Fritz O. 9 months	XII. 7 7300	XII. 10 7200	Exudation Diathesis	Normal	13	Neutral	Negative	Negative	5 times	Trace	1	—
" 9½ "	"	I. 3 7030	"	"	25	Acid	"	Positive	"	30	½	
Alex N. 18 weeks	X. 28 4250	XII. 4 4250	Sugar Intoxication	Normal	7	Acid	Positive	Positive	5 times	10	½	—
Walter H. 4½ months	VIII. 10 —	XI. 15 4780	Acute Dyspepsia	?	7	Acid	Positive	Positive	10 times	40	½	—

TABLE II. NOT-NORMAL INFANTS—*Continued.*

Name and Age of Infant	Date of Admission and Weight	Date of Examination and Weight	Diagnosis	Stool	Amount of Gastric Juice in c.cm.	Reaction to Litmus Paper	Reaction to Congo Paper and Günzburg	Reaction to Uffelmann's Reagent	Dilution of Gastric Juice	Pepsin Value	Time of Test—hrs.	Remarks
Otto W. 4 months	Polyclin. XI. 16	XI. 16 4125	Dyspepsia Vomiting	Muculent	2	Acid	Negative	Positive	10 times	60	½	Vomiting since birth
Felix R. 4 months	X. 17 3250	XII. 2 3665	Dyspepsia	Normal	3	Acid	Positive	Negative	10 times	20	½	—
" 4½ "	"	XII. 18 3690	"	"	2	"	"	Trace	5 times	10	½	
" 5 "	"	I. 8 3700	"	"	4	"	Negative	Positive	"	30	½	
Elsie P. 3 months	XII. 3 2900	XII. 5 2900	Pylorospasm	Obstipation	10	Acid (strongly)	Positive	Positive	5 times	30	½	Breast infant; vomiting after each meal since birth
Karl K. 5 months	I. 27 3000	I. 29 2825	Pylorospasm	Muculent	10	Acid (strongly)	Positive	Negative	5 times	60	½	Vomiting after each meal for 11 weeks
" 5 "	"	I. 30 2825	"		6	"	"	"	"	60	½	
Hertha O. 10 months	I. 14 5500	I. 17 5410	Dyspepsia	—	25	Neutral	Negative	Negative	5 times	30	½	—
Theodore G. 5 months	X. 28 4450	XI. 30 4500	Vomiting	Normal	18	Acid	Positive	Negative	5 times	30	½	—
" 6 "	"	I. 4 4500	Sugar Intoxication	"	15	"	"	Positive	"	10	½	
Wally N. 9 months	XII. 5 7100	XII. 9 6890	Encephalitis	Normal	5	Alkaline	Negative	Negative	5 times	Trace	1	—
Hertha G 2 months	XII. 31 3870	I. 16 3525	?	Normal	5	Acid	Positive	Negative	5 times	10	½	—
Herbert G. 9 months	XII. 19 6000	I. 11 5400	Eczema	Normal	20	Neutral	Negative	Negative	5 times	Trace	1	—

An analysis of the foregoing table gives the following results:

Number of cases examined.........	22
Number of examinations............	34

Of the 22 cases examined,

14 were constantly positive for pepsin.
6 were constantly negative for pepsin.
1 once positive and once negative.
1 three times negative and once positive.

Most of the positive cases were constantly positive, and most of the negative cases were constantly negative.

The chronic atrophic cases were usually negative, and Table II. constantly so. It was, however, noted that in the case of Hugo R., examined on three different occasions with negative results, a fourth examination, after a lapse of one month, during which time he gained 400 grams in weight, gave a positive result. Three syphilitic infants gave a persistently negative result for pepsin. Two cases of dyspepsia with vomiting and diarrhea gave positive tests both for HCl and pepsin. Two cases of pylorospasm were especially interesting.

(1) Elsie P., aged three months; breast baby (vomiting after every feeding since birth); weight, 2,900 grams. The gastric contents after a meal of tea gave a positive reaction, both for HCl and pepsin. This infant was admitted to the clinic in a condition of extremis, and died three days later.

(2) Karl K., aged five months, had the breast up to the age of eleven weeks. Weight on admission, 2,825 grams. Forcible vomiting after every meal since birth. Had one stool daily (small and slimy). This infant was much emaciated on admission. Stomach waves very prominent, pyloric tumor palpable. Examination of gastric contents showed much free HCl. Examinations for pepsin by the Fuld test showed it to be 60 strong. 10 mg. of edestin powder dissolved in 5 c.cm. of the gastric juice was within one-half hour completely digested. The gastric juice contained more pepsin than any other, with the exception of that of Otto W., who suffered from vomiting since birth, but showed no pronounced symptoms of pylorospasm.

An analysis of the table as to the presence or absence of acid gives the following results:

Of the 34 examinations the gastric juice reacted: 17 times acid; 17 times neutral or alkaline.

HCl 14 times positive; HCl 20 times negative.

Lactic acid: 9 times positive; 25 times negative.

Hydrochloric acid and lactic acid occurred together in the same case 5 times.

Tests for acids other than hydrochloric and lactic were not made.

The tests for HCl were Congo paper and Günzburg. For the determination of lactic acid Uffelman's reagent was used. It must now be determined whether the gastric juice in which pepsin and acid are found is capable of digesting albumin. It is here we meet the objection offered by Czerny-Keller to the experiment of Toch, who was able to digest fibrin-flakes after adding 0.3 per cent. HCl gastric juice. To overcome these objections I made a number of experiments with gastric juice, which gave a definite acid reaction. In such acid reacting gastric juice it was found that considerable edestin powder could be dissolved, still leaving a clear solution. It was also found that upon the addition of sodium chloride to this solution, a dense, opalescent cloud occurred just as in the original test solution. It was also observed that where lactic acid instead of HCl was present in the gastric juice, it was capable of dissolving in clear solution considerable edestin, and that it reacted to Na Cl the same as did the Fuld solution.

In cases therefore in which the gastric juice gave a positive test either for hydrochloric or lactic acid, I made the following experiments. The gastric juice was obtained in the same manner as before, and sometimes a portion of the same gastric contents was used for both tests.

Case I. Otto T., aged fifteen weeks. Normal breast infant. Date of examination, December 14th. Weight, 4,300 grams. Amount of gastric juice, 15 c.cm.

Reaction acid. HCl negative. Lactic acid positive.

To 2 c.cm. filtered gastric juice was added carefully as much edestin powder as would dissolve and still leave a clear solution. In another tube, containing 2 c.cm. gastric juice, the same amount of edestin was dissolved and the solution boiled, and again cooled to 37° C. Both tubes were placed in the incubator for thirty minutes, then removed, and Na Cl in substance added to each. The boiled tube gave a deep opalescent cloud, the other remained perfectly clear, showing that the edestin had been digested.

Case II. Hugo R., aged two and one-half months. Weight, 2,740 grams. This was an atrophic infant and gave this time a positive reaction for pepsin with the Fuld test. Amount of gastric juice, 8 c.cm.

Reaction acid. HCl very positive. Lactic acid negative.

In 5 c.cm. gastric juice was dissolved 10 mg. of edestin, still leaving a clear solution. At the end of one hour in the incubator the solution remained clear upon the addition of Na Cl. Test for peptone positive.

Case III. Fritz D., aged ten months. Bottle fed. Weight, 4,030 grams. Amount of gastric juice, 25 c.cm.

Reaction acid. HCl negative. Lactic acid clearly positive.

To 10 c.cm. gastric juice was added 15 mg. edestin powder. The solution remained clear. After the tubes had remained one hour at 37° C., Na Cl was added. That the solution remained clear is proof that the edestin was completely digested. Test for peptone positive.

Case IV. Paul La K., aged 18 weeks. Normal breast infant. Weight, 5,070 grams. Date of examination, January 7th. Amount of gastric juice, 20 c.cm.

Reaction acid. HCl clearly positive. Lactic acid negative.

In 10 c.cm. gastric juice 10 mg. edestin powder was dissolved, the solution remaining clear. After one-half hour at 37°C., Na Cl was added and the solution still remained perfectly clear. Test for peptone positive. To 8 c.cm. of the same gastric juice was added some casein powder. The solution remained at 37° C. for four hours, at which time it gave a typical peptone reaction.

Case V. Walter Teichert, aged four months. Normal breast baby. Weight, 4,850 grams. Date of examination, January 16th. Amount of gastric juice, 5 c.cm.

Reaction acid. HCl positive. Lactic acid negative.

To 2 c.cm. of this gastric juice was added edestin powder (amount not determined). After one-half hour at 37° C., Na Cl was added in substance, and the solution remained clear. On January 18th the same case was re-examined with the same result. Peptone test positive.

Case VI. Ernest L., aged nine weeks. Breast infant. Weight, 3,550 grams. Vomiting several times daily since birth. Date of examination, January 21st. Amount of gastric juice, 25 c.cm.

Reaction acid. HCl negative. Lactic acid positive.

In 10 c.cm. gastric juice I dissolved 10 mg. edestin powder. After one-half hour at 37°C., and upon the addition of Na Cl, the solution remained perfectly clear. Peptone test (Biuret) positive. In order to determine whether the edestin would be digested by the pepsin when only lactic acid was present, I made the following tests.

Solution of 1:1000 edestin in 0.3 per cent. lactic acid reacted quite as well with Na Cl as the original test solution. I made the same solution as for the Fuld test, only that instead of hydrochloric I used lactic acid.

Ernest L., aged eight weeks. Breast baby. Weight, 3,550 grams. Date of examination, January 10th. Quantity of gastric juice, 22 c.cm. Reaction neutral.

With this gastric juice five times diluted, I used the same quantities in six test tubes as in the Fuld test, and to each tube was added 2 c.cm. edestin-lactic-acid solution. After the glasses had stood for one and one-half hours at 37° C., Na Cl was added, with the result that numbers five and six remained clear. To 10 c.cm. of the same gastric juice was added 5 c.cm. of a 0.3 per cent. lactic acid solution, and to this acid solution some casein powder. To a second glass containing 5 c.cm. of the same gastric juice, without lactic acid, was added some casein powder. Both tubes were placed in the incubator for five hours at 37° C. Upon removal, both solutions were tested for peptone. The gastric juice, to which lactic acid was added, gave a positive peptone reaction, the other a negative reaction. These results are entirely in accord with those of Julius Schutz[14], who from his experiments came to the conclusion that hydrochloric acid is not necessary to active pepsin digestion.

From the foregoing series of experiments we may draw the following conclusions:

(*a*) That the gastric juice of normal breast infants contains pepsin; (*b*) that the stomachs of infants suffering from acute digestive disturbances usually contain pepsin; (*c*) that the stomachs of infants suffering from pylorospasm contain both pepsin and hydrochloric acid in greater quantity than the stomachs of normal infants of the same age; (*d*) that the stomachs of chronic atrophic infants frequently contain no pepsin; (*e*) that when these chronic atrophic infants begin to improve in health and to gain in weight, the stomachs again contain pepsin; (*f*) that the gastric juice of normal infants is capable of transforming proteid into peptone, and that it is able to do this without the addition of any other acid than that found normally in the stomach; (*g*) that the pepsin in the gastric juice is capable of active digestion when lactic acid and no hydrochloric acid is present; (*h*) that both hydrochloric and lactic acid may be present in the gastric juice without pepsin, and that pepsin may be present without either hydrochloric or lactic acid.

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SCURVY RICKETS OCCURRING IN A BREAST-FED CHILD.—T. H. Kellock (*Lancet,* October 31, 1908) reports the case of a female child eleven months old, who did well at the breast for nine months, but was then weaned and fed on diluted cow's milk and infant foods. In two months she had become listless and anemic, with diffuse tender swellings on the forearms and legs. There was nothing in the previous history suggesting syphilis, and no teeth had appeared. Some of the long bones were tender on manipulation. A diagnosis of scurvy rickets was made, and under the usual treatment for this affection the child appeared quite well. Sixteen months later the child's mother appeared with a younger child, aged ten weeks. The former appeared ill, anemic, and apparently suffering from want of food. When nine weeks old a swelling appeared about the upper end of the right tibia, which was tender and painful, and the leg became, in the mother's words, "quite paralyzed." The child was sent to the author, as on its first visit to the hospital sarcoma of the tibia had been suspected. When seen the child seemed to be in fairly good condition, and the only part affected was the upper end of the right tibia; here a doughy, tender swelling of some size completely surrounded the bone and the child would make no effort to use the limb. The mother was directed to continue nursing the child, but to give her as well a little orange juice twice a day, at the same time she herself was ordered a mixture containing iron and sulphate of magnesium. At this time, too, it must be mentioned that her circumstances had somewhat improved and that she was getting at any rate sufficient food. The result of this treatment was immediate and rapid, as far as the child was concerned; the swelling on the tibia first became much less tender and in three weeks had almost completely disappeared.—*Medical Record.*

SEA WATER TREATMENT GIVEN BY SUBCUTANEOUS INJECTION, WITH RESULTS OBTAINED IN CHILDREN.*

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The attention of the medical profession was brought to the application of the subcutaneous use of sea water in the treatment of diseases by Robert-Simon, in two lectures delivered in Philadelphia last November.

This treatment followed rationally the theory of the marine origin of life, and the fact established by the investigator, that blood serum and sea water contain the same chemical constituents and in approximately the same proportions.

Endeavoring to find a fluid in which leukocytes continued to live, Quinton discovered that in a solution of sea water leukocytes of not only man, but also of fish, reptiles, birds, dogs and rabbits, continued their ameboid movements for a number of hours. This is the only serum in which this has ever been accomplished. In experimenting on a dog for instance, he injected into it, in amount equal to its weight, a quantity of isotonic sea water, which was eliminated rapidly through the kidneys. There followed no bad effects and within two days the dog was in a remarkably good condition. In another case the femoral artery was opened and the dog bled until it became livid, following which warm isotonic sea water, equal in amount to the blood withdrawn, was injected intravenously. Within a few minutes heart action was resumed and the dog reached a normal condition in about twenty-four hours. In this case there was marked increase in the hemoglobin.

A number of series of experiments have been recorded in France, in which the use of isotonic sea water was compared to that of physiologic salt solution, the results showing that the action of the isotonic sea water is far more rapid, and of more lasting effect than that of physiologic salt solution, while in cases in which no result was obtained by the use of the latter, when sea water was administered the improvement was rapid. This has been noticed particularly in the cases of inanition in the newborn, where the increase in weight per day was almost twice as great with the use of isotonic sea water as with the physiologic salt solution.

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* Read before the Pediatric Society of Philadelphia, March 9, 1909. Discussion on page 383.

Autopsy findings, in cases which have died, show there is a marked proliferation of the cellular elements (myelocytes and eosinophiles) in the bone marrow in cases in which isotonic sea water or physiologic salt solution has been used, but that there was a greater increase of these elements in the cases treated by the sea water than in those treated with salt solution.

The action of isotonic sea water is distinctly tonic. In other words, it supplies to the cell mineral elements which are lacking or needful to its proper action. It, in contradistinction to other serums, has no bactericidal action, but by building up the cell it increases in that way the cellular resistance to infection. Owing to its tonic action, the indications for the use of isotonic sea water are numerous; indeed it might be said to be indicated wherever there is lack of tone or the breaking down of the cells. It is not supposed to be a panacea for all ills, but only to be used as a rapid and valuable aid in conjunction with other treatment.

The solution must be carefully prepared from fresh sea water obtained far enough from the coast to insure against contamination from sewage, that is to say, thirty or forty miles at sea. To avoid bacteria which are found on the surface of the water, it should be collected in sterile bottles at a depth of from thirty to forty feet below the surface, and if possible, when the sea is calm. It is said that water is best obtained where the sea bed is sandy. The solution is made by mixing eighty-three parts of sea water with one hundred and ninety parts of pure spring water. This mixture has a specific gravity of 1.008 and has a molecular concentration equal to that of blood serum. This is of importance owing to the fact that it produces a serum, which, when injected subcutaneously, causes no pain or reaction and is the only serum of which this is true. The mixture is filtered, cold, through a germ-proof Berkfeldt filter and put into sterile bottles. It must not be boiled or sterilized in an autoclave as this produces a change which not only vitiates its action but causes pathogenic effects. It has further been proved that this solution will not continue to have its most beneficial action for a longer period than three or four weeks from the time of the collection of the sea water.

The injections are given by means of a Horwitz irrigating bottle, to the mouth of which is attached a bulb by means of which the pressure is increased so that the solution enters more rapidly. To the outlet is attached a sterile rubber tube some five feet in length and on the end of this is the needle, which is made of platinum, iridium-tipped, and therefore readily sterilized by heating in an alcohol flame. The size of the needle is No. 20 or 21, about an inch and a half long; in other words, between a hypodermic and antitoxin needle.

The two regions used for the injection are just below the angle of the scapula and the gluteal region. The subscapular region is, I think, preferable in children, owing to the ease with which one can get at it and the fact that it is not likely to become soiled by discharges. The region is prepared by washing it with alcohol. Then the needle is introduced rapidly beneath the skin and fascia. The amount of pain caused by this injection is very slight, and if the infant is nursing at the time, frequently there will be no outcry. In older children a cracker or a small piece of chocolate will answer the same purpose.

In infancy the amount injected will vary from 10 c.c. ($\frac{1}{3}$ of an ounce) to 30 c.c. (1 ounce). The initial injection being from 10 to 15 c.c. In older children the initial injection will be from 15 to 30 c.c., increasing to 60 c.c. (2 ounces), while occasionally 90 c.c. may be given.

As a rule, treatment should be given three times a week, and this adhered to with strict regularity or the best results will not be obtained. When recovery has taken place it is well to continue treatment twice a week for several weeks, or to discontinue for two or three weeks and then resume the injections for several weeks. In acute cases it is at times well to give an injection daily for five or six days, depending upon the condition of the patient and need for treatment.

By reason of perfect isotonicity there is practically no pain, except following the first or second injection, when there may be some discomfort owing to the distention of the tissue, causing a sensation similar to that of a bruise. In many cases even this discomfort is lacking. There may be a slight rise of temperature which subsides within six to twelve hours. This we have found to follow only the first or second injection, except in tuberculous cases where there may be a rise of temperature following each injection for some weeks but gradually decreasing and finally reaching the normal.

Through the kindness of an acquaintance I have been supplied weekly with sea water obtained about forty miles off the New Jersey coast, midway between the Capes of Delaware and Sandy Hook. The method of Quinton and Robert-Simon in making the solution has been strictly adhered to and without the aid of a bacteriological or chemical laboratory we have been enabled to put up a very satisfactory solution.

Specific results from this treatment are best shown by tables, which have been prepared. While time will not permit a discussion of the whole series, nutrition cases have been selected as examples. This comprises a series of 21 cases containing 9 cases of inanition during the first weeks of life. The results observed in each case have been marked improvement in the gastro-intestinal condition, with a gain in weight varying from one-half to one ounce daily during the period of treatment. The cases in which bronchitis was secondary showed a rapid clearing up of that condition. While those of hereditary syphilis improved more rapidly than before, under specific treatment. Colic has been a distressing symptom in 3 of these cases and here the relief was rapid. The 6 cases of malnutrition showed marked changes following two or three treatments, the appetite improved, the nervous symptoms were lessened, the number and character of stools showed marked changes, sleep was better and there was a gain in weight ranging from one to five pounds during treatment. All of these cases had a more or less harsh skin which changed greatly. Blood examination was not made frequently enough to give marked results, but in 2 cases we have found increase of the hemoglobin, increase of the leukocytes, and in 2 cases an increase in the red cells. One of the cases of marasmus having tuberculous parentage has not improved very much, but this condition when treatment was started was so bad that we expected a fatal outcome at any time. The other case of marasmus shows marked improvement.

REPORTS OF CASES.

1. B. C., age ten days. Inanition and bronchitis. First treated on December 15th, with 15 c.c., which was repeated on the 17th and increased to 20 c.c. on the 18th. It was noticed that following the first injection the infant took and retained the breast feedings much better and the bronchitis cleared up rapidly.

2. A. B., age twelve days. Inanition and bronchitis. This

infant received six treatments in ten days of 15 to 30 c.c. Here the bronchitis cleared up rapidly, while the feedings were much better taken and retained.

3. B. W., age five days. Inanition and hereditary syphilis. First seen December 16th. Received seven treatments between December 16th and 26th, varying from 15 to 30 c.c. The appetite improved wonderfully, the stools were fairly digested and there was marked improvement in the general condition.

4. B. B., age five days. Inanition and hereditary syphilis. First seen December 16th, receiving in all eight treatments, between that date and the 28th, varying in amount from 15 to 50 c.c. When first seen the skin of the entire body was dry and fissured and had a parchment-like feel. Child was very thin, not feeding well. The appetite improved greatly and the change in the skin was remarkable, returning to a perfectly normal healthy condition.

5. G. W., colored, age four weeks. Inanition and hereditary syphilis. First seen on February 12th, giving a history of having had specific treatment since birth, at present having marked snuffles with syphilitic eruption about buttocks and genitals. Owing to the emaciation and lack of assimilation sea water injections were started on the 24th since which time he has had three a week during thirteen days. Following each injection the gain in every condition has been marked, he has increased eleven ounces in weight, the eruption is much lessened, snuffles improved, sleeps well, is nursed regularly and shows marked improvement in skin and muscles.

6. B. B., age five weeks. Icterus since the second day of life; marked inanition. Had four treatments in nine days; increased eight ounces in weight; shows some decrease in jaundice; much stronger as evinced by the greater power to nurse and a decidedly improved appearance.

7. W. E., age five weeks. Inanition. Owing to loss of milk the mother tried various infant foods with the result that the child lost weight rapidly and showed marked emaciation. Bowel movements frequent, undigested and malodorous. Following the fourth injection during the eight days he has been under treatment the condition of the bowels have improved very much, being now thoroughly digested but still frequent. There has been a gain of six ounces following a loss of one-half ounce. He is much stronger and brighter.

8. M. H., age four weeks. Inanition. Birth weight six pounds, one ounce, increased to six pounds, six ounces, rapidly falling to five pounds, three ounces. Given three injections in six days, gained eight and one-half ounces. His digestion has improved, he is sleeping normally and is better in every way.

9. E. O'B., age six weeks. Malnutrition. First seen January 9, 1909. Breast and bottle-fed, giving the history of constipation, pain and colic with poor sleep since birth, no vomiting, rather hoarse cry, no specific symptoms. Birth weight ten pounds, now seven pounds, four ounces. First sea water injection of 20 c.c. given January 11th. Following second injection there was marked improvement in the colic and slept well. The fourth injection was given on the 18th, the last time that she was seen. Though the increase in weight was only one ounce, she was sleeping well, was nursing well, the bowel movements were normal, and she had no colic.

10. C. C., age eleven months. Malnutrition. First seen when seven months old, during an attack of enterocolitis, at which time her nourishment was fair. There were slight rachitic signs. Weight twelve pounds. When eleven months of age she had only gained one pound and her muscular development was poor. When seen on November 30th, she had marked signs of malnutrition, with fretfulness, enlarged abdomen, liver much enlarged, and marked separation of the recti. Her hemoglobin was 75 per cent. with R. B. C., 4,570,000. She increased rapidly in weight, gaining one pound in the first eight days and another pound in the succeeding eleven days or a total gain of two pounds in nineteen days. Her appetite improved, the stools became normal and her sleep was good. Since the last injection her improvement and gain has been constant.

11. E. McG., age three years. Malnutrition. Sent in on October 12, 1908, for tubercular disease of the hip. The Moro reaction was negative. On December 14th, she was given 15 c.c. of sea water solution, which was continued through five injections, ending December 26th. She increased one pound in weight and her general improvement was marked, having a better appetite, normal bowel movements, much brighter and stronger.

12. H. L. T., age seven years. Spasmodic cough for six months, which was unimproved by removal of adenoids and tonsils. Weight has been almost stationary for four months, there

being also slight evidences of malnutrition. No signs of tuberculosis. Temperature normal, pulse strong. The first injection given December 14th, of 20 c.c., increasing to 50 c.c., in all eleven treatments, covering a period of twenty-five days. There was an increase of one pound and five ounces in weight, with better appetite and a brighter and happier disposition. Unfortunately the blood examination was not made until after the third treatment. Hemoglobin, 95 per cent.; W. B. C., 9,280; R. B. C., 5,130,000. At the end of the treatment the hemoglobin remained the same. W. B. C., 10,320; R. B. C., 5,190,000. For a month following the last treatment he was in the country and in the open air continually, at which time the gain in weight was one pound and thirteen ounces.

13. A. S., age eight years. Malnutrition. First seen January 13, 1909. She was brought for abdominal pain, constipation and loss of appetite, following measles two months previous. She showed quite marked emaciation, flabby muscles, skin harsh and dry, cervical, axillary and inguinal glands all enlarged, rapid, irregular heart action, marked pallor of lips and sclera. Blood examination showed hemoglobin, 85 per cent.; R. B. C., 5,350,000. Weight, fifty-two pounds. On the 16th, she was given a subcutaneous injection of 30 c.c. of sea water solution, which was continued three times weekly until the present time, increasing the quantity to 60 c.c. Between the 16th and the 29th, or seven treatments, she gained 4 pounds in weight, and in the fifteen days succeeding increased 1 pound. There is marked improvement in her appetite, the bowels are moving normally, her color is very much better, her skin has become soft and normal to the touch, and her blood shows very marked improvement. Hemoglobin 90 per cent.; R.B.C. 6,248,000.

14. H. D., age eight years. Malnutrition. Brought for supposed tuberculous spinal disease. First seen October 5, 1908. Family history good, backward in speech, dull, apathetic, does not care to run and play with the other children, very nervous and easily frightened, skin dry and harsh. The Moro test, applied three times, gave no reaction. Tonsils and adenoids were removed on November 12th. His general condition improved slightly up to December 3d, at which time his weight was 42 pounds, and the first subcutaneous injection of sea water was given. Hemoglobin 75 per cent., W.B.C. 5,200; R.B.C. 5,130,000.

Between the 3d and 19th, or during his first seven injections, the improvement was marked. The first sign noticed was that he had a better appetite in the mornings, was less nervous, and brighter. This was followed by more desire to play with other children, and a marked improvement in his color. Blood examination on the 19th, hemoglobin 85 per cent., W.B.C. 14,240, increase of a pound and a half in weight. The next seven injections, covering a period from the 19th of December to the 5th of January, showed still more improvement in his general health, also a brighter mental attitude. During this time there was no increase in weight; the change in the skin condition was very marked, it entirely lost the harsh dry feel, becoming soft and of normal moisture.

15. M. K., age fourteen years. Malnutrition. Complained of poor appetite, chronic constipation and marked weakness. Injections commenced February 10th, 30 c.c. increasing to 60 c.c. Very marked improvement after the third injection, feeling stronger. In fourteen days she received seven treatments and gained 1½ pounds in weight. The condition of the skin, which was dry and harsh, has greatly improved. Hemoglobin has increased from 75 to 85 per cent. in ten days.

16. D. F., age five weeks. Marasmus. The infant of a tuberculous mother and with a sister who gives a tuberculous reaction. He was brought on October 24th for an abscess on the right thigh, just above the knee; and a slight dermatitis. Weight, 7 pounds. He was under treatment until November 25th, at which time he weighed 7 pounds 4½ ounces, was still having frequent bowel movements, somewhat undigested and maladorous. Various kinds of food had been tried without success. He was sent into the hospital, receiving his first treatment of 10 c.c. on November 30th. This was given three times weekly until January 18th, when he received his twenty-fifth injection of 60 c.c., his weight at this time being 8 pounds and 9 ounces, or a gain of 1 pound and 5 ounces. His ability to digest and assimilate food has increased. His strength has increased very much, while instead of being fretful and peevish he is happy and sleeps well. He also has been kept constantly in the fresh air. No injections were given from January 18th until February 8th. Since that time they have been given regularly three times a week. While there has been no gain in weight his digestion is good and his general condition is improving.

17. K. W., age fifteen months. Marasmus. First seen December 2, 1908. Family history negative. In October, 1908, she was in the Municipal Hospital for two weeks with diphtheria; since then had marked marasmus. She had a cough and some difficulty in swallowing. Weight, 13 pounds and 9 ounces. Emaciation with dry harsh skin, which hangs in folds on the arms and legs, so weak that she was unable to sit up, and only moved extremities slightly. Cry was one of weakness. Hemoglobin 80 per cent., R.B.C. 4,410,000. Her weight varied between 13 pounds 15 ounces and 13 pounds 3½ ounces on December 26th, since which time the increase has been continuous, until her weight is now 16 pounds 6 ounces. She has had in all twenty-six treatments, varying from 15 to 60 c.c. in amount. As it had been impossible to get any food that would agree, she was sent into the hospital on January 7th, where the treatments were continued until the 18th. The improvement in the digestion was slight, but the appetite was better and the stools contained less undigested particles. She has been kept in the fresh air constantly, and now her bowel movements are thoroughly digested. She is taking not only milk, but some solid food. The skin is soft and normal. She is bright and happy, not only sitting alone, but standing holding on to the crib, and can now even take a few steps alone. Although the gain in weight has been only about 2 pounds, the gain in muscular tissue and strength has been remarkable. Her cough has entirely disappeared and the chest is in a normal condition.

18. K. G., age ten months. Rickets. First seen September 9, 1908, with chronic diarrhea. Was treated for this condition off and on with moderate success, the stools being four to six daily, containing mucus, moderately malodorous, somewhat undigested, varying from green to yellow in color. She had moderate rickets, the spleen was enlarged and on November 9th palpable one-half inch above the transverse umbilical line. She had been having fever with some sweating, but the blood examination for malaria organisms was negative. Sea water injections were commenced on December 12th, at which time she was having loose green stools. On December 29th she had gained one pound in weight, she was very much improved in her general condition and the spleen was barely palpable, which has continued until the present time. At first examination hemoglobin, 85 per cent.; R. B. C., 5,200,000; W. B. C., 12,000. Unfortunately, the nine injections which were given extended over a period of two

months and were only given at irregular intervals, but the results obtained were good; increase of strength, stoppage of the sweating, reduction in the size of the spleen to about normal. When last seen she was in a perfectly healthy normal condition.

19. C. R., age thirteen months. Convulsions, complicating a pneumonia and followed by laryngismus stridulus in a rachitic infant. The baby was first seen on December 20th, at which time it was found to have a bronchopneumonia with convulsions. On the 30th, owing to the continued meningeal symptoms, dullness, apathy, cephalic cry at times and slight general twitching, it was deemed advisable to use injections of sea water solution, which were given every other day until the 7th of January. There was marked improvement following the first, when the cry was less, the twitching stopped and she appeared stronger. This improvement was more marked after the second, when she knew every one, laughing and could say mamma and papa, which she was unable to do before. Following the third she was able to stand alone, and at the end of the fifth she had entirely recovered. The laryngeal stridor continued in a marked degree, and on the 9th of February she had a convulsion due to an attack of acute indigestion. Owing to the constipation and gastrointestinal symptoms the injections were recommenced on February 10th, continued for ten treatments with marked improvement in the constipation, and decrease in attacks of laryngismus stridulus.

20. S. G., age seven months. Rickets. First seen December 12th, 1908. Weight nineteen pounds. He was brought for enlarged cervical glands. For three weeks a slight cough and vomiting, stools one to two daily, submaxillary glands were very much enlarged, also the inguinals. The spleen was palpable, a finger's breadth below the costal margin, otherwise the abdomen was normal, as were also the lungs. He was given five treatments, from December 12th to December 21st inclusive, 15 c.c. each time. This case showed a considerable improvement in his general condition and a marked decrease in the size of the glands including the spleen, while the gain in weight was eight and one-half ounces.

21. H. P., age five months. Acute gastroenteritis. First seen December 15th; brought for high fever, vomiting and diarrhea. He was in a profound toxic state, showed marked emaciation and a temperature from 101° to 104°F. He had also a pro-

DISEASES OF NUTRITION.

	Inanition.									Malnutrition.						Marasmus.		Rickets.			Acute Gastro-enteritis.
	Bronchitis.	Hereditary Syphilis.			Icterus.															Cervical Adenitis.	
Cases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Age	10 days	12 days	5 days	5 days	4 wks.	5 wks.	5 wks.	4 wks	6 wks.	11 mos.	3 yrs.	7 yrs.	8 yrs.	8 yrs.	14 yrs.	5 wks	15 mos.	10 mos.	13 mos.	7 mos.	5 mos.
Number of Injections.	3	6	7	8	6	4	4	3	4	6	5	11	18	22	9	33	26	9	5	5	9
Number of days under Treatment	5	10	10	12	13	9	8	6	7	20	12	25	46	87	16	90	88	60	8	9	13
Dosage	15–30 c.c.	15–30 c.c.	15–30 c.c.	15–30 c.c.	15–30 c.c.	10–30 c.c.	10–30 c.c.	10–30 c.c.	20–30 c.c.	15–30 c.c.	15–30 c.c.	20–50 c.c.	15–60 c.c.	30–60 c.c.	15–60 c.c.	15 60 c.c.	15–60 c.c.	15–30 c.c.	15–30 c.c.	15 c.c.	15–60 c.c.
Cured	x	x	x	x	...	...	...	...	...	x	x	...	x	x	..	...	..	...	...	...	...
Improved	...	...	...	...	xx	x	x	x	x	...	x	...	...	...	x	x	x	x	xx	x	Died
Original Weight.	...	...	...	...	8.11	6.	5.3½	5.3	7.3	13.	29	43.	52.	42.	75	7	13.9	18.8	...	19	. .
Loss after first Treatment.	0	0	0	0	0	0	.½	0	.1 oz.	0	0	0	0	0	0	0	.5¼	0	...	0	...
Ultimate Gain.	...	...	...	...	11 oz.	8 oz.	6 oz.	8⅛ oz.	1 oz.	2 oz.	1 oz.	1.5 oz.	5 oz.	2.8 oz.	1.8 oz.	1.9 oz	2.13 oz.	1.1 oz.	...	8⅛ oz.	...
Blood Ex.	...	...	...	...	...	...	...	...	...	...	...	Hb. 95% 95% W. B. C. 9,280 10,320 R. B. C. 5,130,000 6,190,000	Hb. 85% 90% W. B. C. 6,600 R. B. C. 5.350,000 6,248.000	Hb. 75% 85% 85% W. B. C. 5,200 14,240 12,000 R. B. C. 5,130,000 4.1 8.000	Hb. 75% 85%	...	...	Hb. 85% W. B. C. 12,000 R. B. C. 5 200,000	...	...	Two intravenous injections 100 c.c. 150 c.c.

lapse of the rectum and a severe catarrhal stomatitis. He was given 15 c.c., which was increased rapidly to 60 c.c. Injections were given daily for six days, with cessation of vomiting and improvement in consistency and number of bowel movements. The temperature remained high and toxic symptoms persisted. On December 23d, owing to the marked pallor and signs of approaching death, a vein in the right arm was opened and 100 c.c. of warm sea water solution was given slowly. The change in the patient was remarkable; it was noticed that the pallor became more intense, respiration practically stopped for fifteen seconds, then there was a long sighing inspiration, followed by a slight flushing of the cheeks, spreading slowly over the entire body. At the time the vein was opened the child was pulseless at the wrist and the heart could just be heard beating. Within a minute after the injection commenced, a feeble pulse was obtained at the wrist, which increased rapidly in strength. His condition on the 24th and the 25th was good, but on the 26th he again went into collapse. At this time 150 c.c. of warm sea water solution was injected into a vein in the left arm. The same improvement was noticed, but he died on the 29th.

ECZEMA IN INFANTS.—Mendelsson (*Munch. Med. Woch.*, October 20, 1908) says that, according to Finkelstein, the eczema of infants is due to disturbed assimilation of the salts in milk; its treatment therefore is not local, but must consist of dietetic measures. The best diet is poor in salt but rich in proteid and fat, and is prepared by removing the salts of milk by washing the casein in water and then mixing it with diluted whey. Mendelsson obtained very good results with Finkelstein's diet, the eczematous conditions disappearing much more quickly and surely than with the older local treatment. The loss of weight noted on this diet should not stop its use, as it is caused by the rapid loss of water with the removal of salts in the tissues. The diet, however, should be tried only in such children who can bear fat well; such infants are usually large for their age, have a pasty skin and are prone to manifest not only eczema but other phenomena of "exudative diathesis." They stand the withdrawal of salt very well if it is not continued too long after the curative effect upon the eczema has been noted.—*Medical Record.*

CLINICAL MEMORANDA.

FIVE CASES OF EPIDEMIC INFANTILE PARALYSIS.*

BY A. HYMANSON, M.D.,

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In the summer of 1907, when anterior poliomyelitis was prevalent in Greater New York, I treated a great number of cases. Five of these I shall describe here, as they are rare and exceedingly interesting. Their symptomatology has shown a wider variation than that described in the text-books, and not only the spinal cord, but the brain as well was affected.

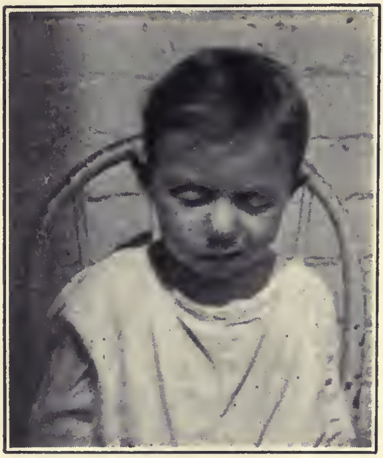

FIG. 1. Showing facial paralysis.

Case I. — Bernard L., twenty months of age; family history negative. Became ill three days before admission to the Beth Israel Hospital (August 5, 1907), with vomiting, restlessness and fever. His articulation was very indistinct, and of a mumbling character. For several days the child did not utter any sound at all, nor did he recognize his parents. He had some difficulty in swallowing, although there was nothing abnormal in his throat. Temperature 102.5°F., pulse between 120 and 140, respiration 32 to 40. There was paralysis of the right side of the face, but no disturbance of sensation. The right eye did not close well at first, but three days later it did. The eyes and ears were examined and found in perfect condition. Urine, blood and lumbar puncture did not reveal anything abnormal. At the end of the third week the facial muscles lost their power to respond well to faradization. There was some reaction of degeneration.

Case II.—Dora S., three and one-half years old, was sick for three days before admission to the hospital on August 7th. Her illness began with fever, vomiting, slight cough, complete absence of speech, and restlessness. Temperature 101-102°F., pulse 120-130 during the first two days. There was occasional tremor in the left lower extremity. On August 8th it was noticed that the child did not move either her upper or her lower extremities. On August 10th a right facial palsy was noticed, but the paralysis did not affect the eye muscles, as the child closed its eyes well. In a day or two the facial paralysis became more marked, but the child regained consciousness, although she had a staggering gait, and dragged her left leg somewhat. The patellar reflex was somewhat diminished. Urine, blood and spinal fluid were negative. The child regained the use of its extremities, but the facial palsy is still present. The faradic irritability is somewhat diminished and the susceptibility to the galvanic current is somewhat increased.

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* Read before the Clinical Society of the Alumni Association of Beth Israel Hospital, December 26, 1907.

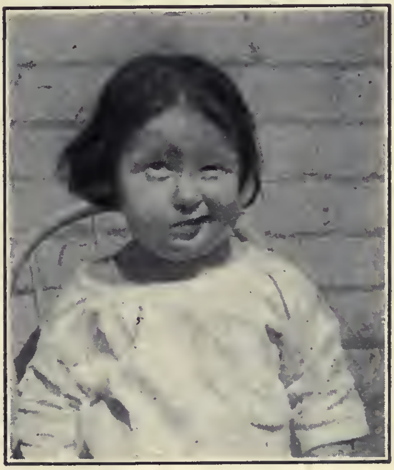
FIG. 2. Showing facial paralysis.

Case III. — Harry W., eight and one-half months of age, breast-fed, was healthy until September 15, 1907. He was able to raise himself in his cradle and stand with help; he also made attempts to creep. He became sick, having a temperature of 104°F., and vomiting; was restless and cried steadily. The next day he had several convulsive attacks, his face and arms twitching. There was also some rigidity of the neck and slight opisthotonos. At the same time it was noticed that there was complete loss of power in both lower extremities, particularly on the right side, but sensation was present. There was some paralysis of the right arm and distinct paralysis of the right side of the face. The eye muscles were not involved. Blood and urine were negative, lumbar puncture was made, but the fluid was sterile. The paralysis of the arm disappeared without treatment in a few days. At the end of two weeks the facial nerves responded to faradic and galvanic currents. It took four weeks for the facial palsy to disappear, while the lower extremities are still paralyzed. Right patellar reflex is absent, left diminished. The electrical examination of the lower extremities, made on December 20th, showed the presence of the reaction of degeneration.

The most interesting feature of Case I. is the fact that the meningeal symptoms were very marked, although the spinal cord was not involved at all. The clinical picture of Cases II. and III. shows an inflammation which actually extended far above the spinal cord. The symptoms of anterior poliomyelitis were marked, and the implication of the facial nerve in all 3 cases constitutes a complication worth while recording. The fact that the eye muscles and nerves were not affected in Cases II. and III., the children being able to close the eye on the affected side, shows conclusively that the lesion was within the brain, perhaps above the facial nucleus, in the lateral tract of the medulla oblongata.

According to Gowers, facial paralysis is very rare in children under ten years of age. During all his years of practice he has seen only 3 cases.

Case IV.—Harry S., six months old. The baby was nursed by its mother and was well until August 23, 1907, the night before its admission to Beth Israel Hospital. On that night it became somewhat feverish, had a slight cough, and was suddenly seized with several mild convulsive attacks. On examination the child showed some dyspnea, and there was a moist rattling in the pharynx and trachea. The face was pale, somewhat cyanotic, the pupils reacted to light, the tongue was moist. No exudate in the throat, but slight paralysis of the uvula, some hoarseness and difficulty of deglutition. Temperature was 100° F., pulse 150-160, respiration 50-60. There was exaggerated costal movement: it seemed the ribs moved upward and there was no descent of the diaphragm.

During inspiration the abdominal contents seemed to be uplifted under the ribs. At times he had convulsive attacks, twitching being more marked on the left side. There was slight paralysis of the upper and lower extremities, more marked on the left side.

A culture was taken from the secretions of the nose and throat, but no Klebs-Lœffler bacilli were found. A lumbar puncture was made, but no fluid was obtained. Soon after the admission of the child a marked dyspnea, resembling laryngeal obstruction, led us to think that intubation might relieve the condition. This was done, and temporary relief was obtained, but the dyspnea continued, making it necessary to remove the tube. The child died of laryngeal and diaphragmatic paralysis nine hours after its admission to the hospital.

The sudden onset and short duration of the disease, the paralysis of the extremities, diaphragm and larynx, leads me to believe that this was a true case of Landry's paralysis.

Case V.—Pauline I., sixteen months of age, was admitted to the Beth Israel Hospital August 20, 1907. Family and previous history negative. Child was nursed by its mother and became suddenly ill, with high fever and marked prostration.

On its admission the child was very anemic, prostrated and semicomatose, pulse hardly perceptible. Sensation and motion of the upper and lower extremities were absent. There was paralysis of the velum and absence of movement of the soft palate when touched with a probe. The child was unable to nurse, so that we were obliged to pump the mother's breast and feed the child artificially in order to keep it alive. The bladder and rectum were not involved, except that the child did not micturate for twenty hours. There was slight stiffness of the neck, but no paralysis of the face. She did not cry at all for two days. Heart and lungs were normal.

At first I thought it was a case of myelitis, but two days later the child began to rally, sensation being noticed in the upper and lower limbs, but there was still loss of motion. There was also some paralysis in the upper part of the abdomen, above the umbilicus. About the tenth day the paralysis of the soft palate and of the abdomen disappeared. The reaction of the degeneration of the four extremities was present on October 1, 1907.

A careful analysis of the above cases conclusively shows the correctness of the statement made by Professor Harbitz and Dr. Scheele, of the University of Christiania,* that in a severe or fatal case of acute poliomyelitis there is a diffuse inflammation of the entire cord with its pia mater, of the entire medulla oblongata and pons, of the basal ganglia, and often also of the cortex cerebri and its pia mater.

139 Henry Street.

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* Journal of American Medical Association, Vol. XLIX., No. 17, p. 1,423.

REPORT OF A CASE OF CONGENITAL HEART DISEASE.—DEFECT OF THE VENTRICULAR SEPTUM AND ABSENCE OF THE PULMONARY ARTERY.—SYMPTOMS OF ANGINA PECTORIS.*

BY ALFRED HAND, JR., M.D.,

of Philadelphia.

A few unusual features in the clinical symptoms and pathological findings induce me to make the following report. As an introduction I quote from Hochsinger's article on "Congenital Heart Disease" in Pfaundler and Schlossmann's *The Diseases of Children,* in which he states that while pulmonary stenosis is very frequent, comprising three-fifths of all congenital cardiac anomalies, and, with a defective septum, allowing of longer life than other forms of congenital heart disease, yet complete obliteration of the pulmonary artery is rare. If the stenosis occurs early in fetal life, then complete partition of the heart is prevented and those portions of the septum which are normally formed under the aortic valves are usually absent. Other authorities state that septal defects are more common in the anterior muscular part than in the membranous part, which is just below the aortic valves, the so-called undefended space.

My own experience is limited to 2 cases, the first one showing a defect in the muscular part, the second, the case under consideration, having a defect primarily of the membranous, but also involving the muscular portion.

The notes of the case are as follows:—

S. J., male, colored, three years old, was admitted to the Children's Hospital on July 10, 1907, for "spells," which began three months ago, the first occurring in April, one in May, two in June, one daily for the first five days of July, and two daily for the five days before admission. The mother described these spells as something like convulsions, starting with a scream, but without biting of the tongue or falling and bruising himself; the child seemed to have pain during the attacks and the breathing was deep, rapid and noisy; the duration of each attack was about an hour, after which the child would go to sleep. The family and personal history obtained on admission was negative, but it was subsequently learned that the doctor who was present at his birth said that he was a "blue baby."

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* Read at the Twentieth Annual Meeting of the American Pediatric Society, Delaware Water Gap, May 25, 1908.

The notes made by the resident physician, Dr. Vail, on admission were: A fairly well-developed boy; head of fair shape; anterior fontanel open the size of a five-cent piece; eyes and ears normal; throat hyperemic; boy walks properly. Lungs everywhere resonant; large râles at both bases; sounds are rough and friction-like at the left base. The heart is rapid and regular. Abdomen not sunken; liver extends 2 cm. below the ribs; spleen is not palpable. Extremities are negative except that the legs and thighs appear underdeveloped. Kernig's and Babinsky's signs are negative; no ankle clonus; no tâche. A convulsive or dyspneic attack occurred on July 11, from 7:45 to 9:40 A.M., with much cyanosis, great relaxation, dyspnea, weak and rapid pulse; the child could be aroused; there were no tonic or clonic movements.

When I saw the patient a few hours later physical examination was negative, except for soft breathing over the base of the right lung posteriorly with slight impairment of percussion-resonance at the angle of the scapula, and also marked dullness over the upper part of the sternum. The idea was therefore entertained of an enlarged thymus with attacks of thymic asthma.

On July 12 there was an attack lasting from 12:30 to 3:45 A.M., with dyspnea, cyanosis and suprasternal recession. Examination later showed the lungs to be perfectly clear, but a striking phenomenon was found in the loudness and clearness of the heart sounds, which were heard all over the precordium, to the right of the sternum and up to the second interspace; the sounds seemed close to the ear of the listener, but there was no murmur to account for the clubbing of the fingers; the apex beat was not displaced, but the cardiac dullness extended nearly one cm. to the right of the right border of the sternum. The possibility of enlarged posterior mediastinal glands pushing the heart forward was considered, but Eustace Smith's sign was negative.

On the following day, July 13, I had my first opportunity of seeing him in an attack; he was lying on the right side with his hands pressed against the precordium; his face bore an expression of pain and there was an audible groan with each expiration, the respirations being slow and labored. On auscultation the air was heard entering the lungs easily, the heart sounds were tumultuous and loud and the precordium heaved with the force of the beats, with which the feebleness of the radial pulse contrasted strongly. The mind seemed perfectly clear. The whole attitude and the symptoms suggested pain connected with the heart, an angina pectoris; so a hypodermic injection of morphin (gr. $^1/_{12}$) was immediately given, and in twenty-five minutes the patient was asleep. In the absence of murmurs, what the pathological cardiac lesion was could only be conjectured beyond a decided hypertrophy, with some degree of dilatation. Although there was no generalized nor local edema, failing compensation was undoubtedly present, as shown by the high hemoglobin count, above the maximum figure of 120 per cent. on the Dare scale, and the high count of the red cells, the figures for which were unfortunately not recorded. The attacks of pain were also looked on as due to an acute dilatation of the different chambers of the heart, more particularly of the auricles following that of the left ventricle, which seemed overworked in a vain attempt to overcome some great resistance to the general circulation.

The attacks were subsequently controlled in the severity of the pain by the use of morphin, a hypodermic at the onset being followed by relief in a few minutes, but the frequency remained the same, and an alarming one occurred on the seventh day after admission, with cessation of respiration for a short time.

Fever was present every day, of an irregular type, the morning temperature being usually normal and the evening showing a rise to 103° or 104° F., until the tenth day after admission, when it rose to 107.4° F. just before death.

At the autopsy, aside from a hypostatic congestion of the lungs and anemic infarcts in the spleen and left kidney, the main interest centered in the thymus, which was decidedly enlarged, and in the heart, which extended 4½ cm. to the right and 6½ cm. to the left of the midsternal line; its dimensions were 9½ cm. long, 7½ cm. wide, and 3 cm. thick, and it weighed 115 grams. Careful search failed to disclose any trace of the pulmonary artery, but there was a great deficiency of the interventricular septum, and the ventricular wall, especially on the left, showed decided hypertrophy. The absence of the pulmonary artery and the appearance of the endocardium explained the absence of murmurs during life and the inability to diagnose the condition.

DISCUSSION.

DR. JACOBI.—The nutrition of the lungs in these cases takes place by dilated bronchial arteries coming from the aorta. They take the place of the ramifications of the pulmonary artery, which is absent or stenosed. Life in such cases may be prolonged, as the writer has said. I published such a case in the ARCHIVES OF PEDIATRICS some ten years ago. The patient was twenty-nine when he died and he died only of very copious pulmonary hemorrhage. I believe that these cases are not very rare, and most of them are diagnosticable, as the writer says. There is a loud systolic murmur in many that extends all over the heart, by no means in all. The fact that the two ventricles are alike is simply the same as we have at birth—then the two *are* alike, normally. The circulation remains fetal, as it were, and the two ventricles remain alike.

HOLDING BREATH SPELLS IN CHILDREN.—Neuman (*Arch. für Kinderhk.*) calls attention to the frequency of this condition, to which little attention is paid in the literature. The condition is found most often in nervous children. As a result, usually, of nervous excitement, the child suffers a momentary spasm of the muscles of respiration, becomes markedly cyanotic, at times quite unconscious. During the attack the child usually falls backward, and the spasm ends with a loud cry and a forced expiration. The duration of the attack is usually measured by seconds. Spasm of the glottis is never associated with the condition. Examination also shows the absence in nearly all cases of the symptoms of tetany, with which the condition cannot be brought into relation. The spasm has nothing to do with epilepsy. The importance of the condition lies in the diagnostic significance that its presence affords of a neuropathic constitution. Neuman holds that the condition may be regarded as a very early sign of neurasthenia. Inasmuch as the attacks rarely occur after the fifth year, and as they are never fatal, their importance is to be found merely in their suggestiveness as to a neuropathic temperament, or as manifesting a very early sign of a neurasthenia, to be later more fully developed. The treatment of the attack consists in irritation of the skin by throwing cold water in the face, and the general treatment is that of neurasthenia.—*Woman's Medical Journal.*

ANGIONEUROTIC EDEMA, WITH REPORT OF A CASE.*

BY S. SEILIKOVITCH, M.D.,
Pediatrist to the Mount Sinai Hospital, of Philadelphia.

Angioneurotic edema at present is classed among the vasomotor and trophic diseases. It is a disease characterized by the appearance of a circumscribed edematous swelling of the skin or mucous membrane without giving rise to any constitutional symptoms. Until 1876, symptoms of angioneurotic edema (name given by Strübing in 1885) were described by some observers, but it was not looked upon as a disease by itself, but was confounded with other affections. Quincke, in 1882, described it as an independent disease under the name of "acute circumscribed cutaneous edema." The pathology of this condition is as obscure at present as it was in the seventies, and the explanation of it is only a supposition. As some cases of angioneurotic edema were simultaneously or at different times affected by urticaria, Milton in 1876 and Rapin in 1886 described them under the name of "giant urticaria." This coincidence has been demonstrated by Hartzell and others; especially Oppenheimer and Osler consider the relation of the two affections so close that they believe them to be identical; the only symptomatic difference is the itching and intensity of the affection. All cases reported by all observers are in persons who are of a neurotic disposition, or who belong to a neurotic family; the neurotic taint is either acquired or inherited. Osler in 1885, Ricochon in 1895, and Schlesinger in 1898, reported cases occurring in families during four or five generations, in each of which families one or more members were affected by angioneurotic edema. The exciting causes observed are numerous: mental or physical exhaustion, emotional disturbances, exposure to cold, alcohol, traumatism, gastrointestinal disturbances, and again in many cases the cause is undiscoverable. The patient usually complains of no symptoms, except the local swelling which gives the sensation of some tension. The swelling, which is circumscribed, may appear on different parts of the body—face, legs, hands, eyelids, lips, larynx—persists for a day or more, disappears to reappear on same or other part or on different portions of the body simultaneously. The swelling, which varies in size, is generally soft, paler than the surrounding tissue, but occasionally may be hard, indurated, and red or purplish in color. Angioneurotic edema may attack the stomach. In such cases symptoms of nausea, vomiting and abdominal colics will be found. As gastrointestinal irritation may produce an external urticaria, it is easy to suppose that it may cause an angioneurotic edema of the stomach, especially when we will adhere to the theory that angioneurotic edema is the same condition as giant urticaria, varying only in intensity. R. S. Morris reported a case of angioneurotic edema of the stomach, a condition which was confirmed microscopically. A portion of the gastric mucosa obtained by the stomach tube was examined; extreme edema of the interstitial tissue was found, the lymph spaces and vessels being enormously dilated.

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* Read before the Philadelphia Pediatric Society, March 9, 1909.

The condition known as "periodic, recurrent or cyclic" vomiting, very often at first mistaken for acute indigestion or obstruction of the bowels, is in my opinion to be diagnosed by exclusion as angioneurotic edema of the stomach. The same holds good in regard to a condition known as "hydrops articulorum intermittence," which some authors consider as a separate disease and mention in their text-books as such. It is the same angioneurotic edema of the joint under a different name.

Few fatal cases were reported, and death may be due to exhaustion—from vomiting, if it attacks the stomach, or from suffocation when the larynx is affected. Angioneurotic edema occurs mostly in early adult life, though children may be affected too. The case I am going to report I believe to be the first on record of a fatal case in so young a child.

On November 4, 1908, Mrs. R. brought her infant, then four and one-half weeks old, with the history that when the child was three weeks old a swelling appeared on the genitals, which was relieved in a day by the application of camphorated oil and an ointment; that two days after this the right side of the face became swollen from the upper eyelid down to the lower lip. This lasted one day and was followed by a similar swelling on both arms, which remained three days, and disappeared. The child then remained free from swelling for two days, when the genitals again became swollen. This time the applications did not relieve it as the mother had thought they did before.

The family history was that the mother, aged twenty-four years, was physically well, but of an excitable disposition. There were two other children in the family, aged respectively three and four years, the oldest of whom had convulsions with the eruption of each tooth. The patient was stillborn and resuscitated with difficulty, but had thrived, and was well up to the onset of the present trouble.

Examination showed a perfectly developed female child, normal in every way, except that the left labium major was swollen to five times its normal size, the swelling being hard, indurated and purplish in color. There was no sore abrasion of the skin or swelling in any other part of the body. The umbilicus was in a healthy condition.

Three days later the child was again brought to the clinic. It was restless, refusing the breast; had vomited twice. The bowels were regular, the temperature normal. The swelling of the left labium was much smaller and softer, the color being nearly that of the surrounding healthy tissue. The right labium was swollen, and hard. A circumscribed soft swelling appeared on the calf of the left leg, pale in color. The mother refused to leave the child in the hospital. On the next day she reported that the child had died from a convulsion, before having which it gradually turned blue in the face.

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ACUTE PARENCHYMATOUS NEPHRITIS.—Karsner (*New York Medical Journal,* December 5, 1908) reports a case of acute parenchymatous nephritis in an infant who died forty-five minutes after birth (a few minutes after the cord was cut). Autopsy showed nothing which could have caused the nephritis, and the mother was healthy in every respect. The writer believes that there must have been some obscure nephric irritant in the fetal circulation.—*Boston Medical and Surgical Journal.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Report of Stated Meeting, Held February 11, 1909.
(Continued from April ARCHIVES.)

DR. ELI LONG, CHAIRMAN.

A STUDY OF THE EYE IN MENTAL DEFECTIVES.

DRS. L. PIERCE CLARK and MARTIN COHEN presented this paper. They said that fundus examination in idiocy had been little emphasized, probably because of the negative findings of Moss, who examined 116 feeble-minded children in Berlin and reported but 2 cases with alteration of the fundus. However, Gelfe had examined 578 cases, and but 27.5 per cent. showed normal eyes, which results were quite in accord with their findings. This study of the eye in mentally defective children was undertaken with a twofold purpose. (1) It was thought that careful examination of the fundus in mental degeneracy, such as imbecility and idiocy, ought to throw light on the nature of optic nerve changes in dementia precox. Fully three-fourths of all cases of idiocy in the present study showed varying stages of a retrobulbar neuritis of a degenerative character. (2) The second object of inquiry was to see whether there were pathognomonic structural defects in the eyes of feeble-minded children and idiots comparable with the other grosser mental and physical defects so well known. The negative findings of this second part of the study had been disappointing. It seemed that the eye defects in idiocy did not usually extend beyond those of mere functional incompetence of vision. The defective central enervation might explain the lack of visual acuteness. The study was made in the Randall's Island service where there are 1,000 cases to select from. One hundred and fifty cases were selected, but only 129 could be examined carefully. Fifty cases each of feeble-minded, imbeciles and idiots were chosen. Changes in external examination of the eyes were found in but few patients; unilateral ptosis was noticed in two feeble-minded children; strabismus was found in one feeble-minded child. The pupillary reflexes to light, accommodation, etc., were present in all, but sluggish in the idiot. The acuity of vision, the fields of vision and the refractive errors could not be determined owing to lack of coöperation due to the mental defect. By means of the retinoscope there were found 4 cases of myopia of high degree, 3 of hypermetropia and 15 of astigmatism of various types.

The ophthalmoscopic examination was made by means of the indirect method, with a candle as the source of light. In only 106 of the 129 could the fundi be properly examined. Of 29 feeble-minded children examined only 9 showed normal fundal appearances. Pallor of the temporal half and edema of the nasal half of the disc were present in 7 cases. Two patients showed slight indistinctness of the disc and one well-marked neuritis. Evidence of the early stage of atrophy was found in 6 cases. In none was there advanced atrophy present. Dilatation of veins was seen in 4 patients. Of 24 imbeciles examined 15 had eye grounds normal in appearance. Only 4 patients showed pallor of the temporal half and edema of the nasal half of the disc. Slight indistinctness of the disc was present in one patient. Pallor of the disc was seen in these cases. One patient showed well-marked atrophy. Of 53 cases in the group of idiots normal fundus appearance was present in all but 11 cases. Temporal pallor and nasal edema were seen in 13 cases. There was general congestion of the entire disc in 1 case, generalized pallor of the disc in 8, optic atrophy in 3, dilated veins in 1. One patient each showed choked disc, thrombosis of the central vein, retinal congestion, retinal hemorrhage. It was concluded that there was a well-marked tendency to neutral as well as psychic degeneration in the great majority of all grades of idiots.

Discussion of Dr. Clark's Paper.

Dr. Charles H. May said that nineteen or twenty years ago he had service at the Randall's Island Hospital and had made observations on 60 cases. The notes were incomplete because he was unable to make an examination of the fundus. He found a great many external anomalies, and in this respect his results differed somewhat from those expressed in Dr. Clark's report; in fact, 10 per cent. of all such patients had squint. Another feature in these cases was the large number of instances of anisometropia, such as myopia in one eye and hypermetropia in the other.

Dr. Henry Hawkins Tyson said that his observations upon the eyes of mental defectives were based upon the examination of a few cases in private and clinical practice, but principally upon the inmates of the institution on Randall's Island, making a total of about 40 in all. Dr. Tyson discussed the causes of optic atrophy in defectives in detail. He was inclined to the opinion that the optic nerve lesion was the result of some intracranial inflammation, in addition to the degeneration.

Dr. Martin Cohen said that this investigation was conducted at the suggestion of Dr. Clark. The report was necessarily not conclusive on account of the great difficulty encountered in an examination of this class of patients.

OBSERVATIONS ON THE USE OF LACTIC ACID BACILLI AT THE BABIES' HOSPITAL DURING THE PAST SUMMER.

Dr. Charles Gilmore Kerley presented this paper. During the past summer (1908) milk soured with tablets containing a pure strain of the lactic acid bacillus had been used in the services of Dr. La Fétra and Dr. Kerley in the Babies' Hospital. The milk was prepared in the diet kitchen of the hospital, one tablet being dissolved in 4 ounces of water and mixed with 1 quart of milk. This mixture was allowed to stand for twenty-four to forty-eight hours. It was then diluted with water or cereal water and milk sugar or cane sugar added. The dilution depended upon the age and the assumed digestive capacity of the patient. The child's caloric requirements were considered in each case. It was used in 34 cases, full milk being employed in 30 of these and skimmed milk in 4.

Two groups of children were treated. The first group of 15 were distinctly feeding cases, varying in age from one to sixteen months. Twelve were under six months in age. In 11 of these full milk was used, and in the remaining 4 skimmed milk. In the 11 using full milk every one but one lost in weight and this one gained ½ ounce in two weeks. One made a loss of 4 ounces in two days. One child in fair condition lost 6 ounces in three days without a sign of illness and took the food well. The 4 that took the soured skimmed milk fared as badly. Three failed rapidly and died in from two to nine days from inanition. The results were so disastrous that the observation on feeding cases was discontinued at this point. The children were not made ill by the soured milk, but simply faded away. In a large experience he had never seen a more typical picture of depression, prostration and pallor as was shown by this group of babies fed on soured milk.

The second group comprised babies who were fed the soured milk after intestinal disease. It was well known how difficult it was, after a severe attack of summer diarrhea, to bring the child to a thriving cow's milk diet. It was thought that this protracted convalescence might be shortened by the use of soured milk. It was used in 19 cases after the subsidence of acute symptoms, when freer feeding might be resorted to. The patients ranged in age from one to fourteen months. Nine were over six months, and two of these over one year. The milk was used as in group one, the duration of its use being from one to sixteen days. The milk was refused absolutely by two. A very rapid loss in weight made it necessary to discontinue the milk in 4 others after using it from two to four days. Only 4 of the children gained in weight; one gained 7 ounces in sixteen days; a second, 2 ounces in sixteen days; a third, 10 ounces in fifteen days, and a fourth 1 ounce in six days. But 2 in the series made a satisfactory showing. The usual methods of resuming stronger feeding gave results that were incomparably better. The results were so far inferior to those of the usual methods of treatment that further observations were discontinued.

Discussion of Dr. Kerley's Paper.

Dr. Josephine Hemenway said that there were two points that impressed those at the Babies' Hospital. First, there were children who were brought to the hospital, not hopeless by any means, but who were not gaining in weight. The change in some of these babies was so sudden that at rounds it was possible to pick out the ones who were fed on acidified milk. A child might have been bright and cheerful the night before; in the morning it would appear prostrated and pale, with simply no life at all. Several children failed very rapidly under the use of the acidified milk.

The second point was that the food given failed to fatten the children. None of the children made any improvement so far as putting on fat was concerned, and this was especially so in those cases fed on soured skimmed milk.

In a series of gastrointestinal cases, in which the acidified milk was used, while the children lost in weight, the stools became good. They had had a small series of cases under observation of winter gastrointestinal trouble; after giving an initial purgative, then two days' starvation, the children were fed on fat-free acidified milk for three or four days. After the character of the stools had changed for the better these children were placed on the regular milk modifications. They did not have a bad result in that series.

The only other class of cases in which the acidified milk was used was that of chronic intestinal indigestion; these children were older and had an accompanying constipation. There seemed to be a definite improvement under the use of this milk. In these cases, however, it was not used as the only article of diet.

Dr. L. E. La Fétra said that he had seen a number of these cases at the Babies' Hospital last summer. There was no doubt that these children did worse, as a rule, when fed with this acid milk than such cases usually do on the diet customarily used. It was a great disappointment to find that the use of the lactic acid bacilli, for which so much had been claimed, turned out so badly, although he had anticipated that the use of the suspension of the bacilli would turn out in this way. It was almost impossible by injecting into the rectum to get any of this suspension as far as the ascending colon where it would do good. If these lactic acid bacilli could be used by the mouth in sufficient quantities, and in good culture media, they might possibly be carried through the tract and exert a favorable action.

He felt that there was a distinct field for the use of buttermilk. Buttermilk had little or no fat, and the cases in which it was indicated tolerated fat badly. Again there were those patients with putrid stools, alkaline rather than acid; in such patients the use of buttermilk was attended with good results. He had had very satisfactory results by using fat-free buttermilk for a period of one week or ten days, using it for the purpose of changing the character of the intestinal contents. The stools, instead of having a foul and putrid odor, would change and have an acid odor. When the stools became normal he changed the diet and used some other form of food without further use of the buttermilk. He said he had had four very satisfactory results with the use of preparations of ripened milk made by the Walker-Gordon laboratory. He thought there was a distinct field for the use of the lactic acid bacilli, but the hospital babies did badly on them.

Dr. Henry Dwight Chapin thought that it was valuable to get such reports occasionally, but whatever was said in regard to the feeding of infants in hospitals he received with a great deal of skepticism. The babies in hospitals did not do very well on anything. It was rare for one to give them anything in the way of food and have them gain in weight. The hospitals should only be for those acutely ill, and they should be sent out as soon as possible.

With regard to the stools, he did not give too much consideration to them so long as the babies gained in weight; he said he had come to the conclusion that if food could be given the baby under conditions that were not disadvantageous, and if the baby gained in weight, it was not wise to interfere too much with the feeding, no matter how bad the stools were. If the child lost in weight and the stools were bad, he at once changed the feeding. He thought there was but a narrow and very restricted use for buttermilk or the lactic acid bacilli in cases with putrefactive conditions in the stools; but good might sometimes result from the temporary use of them.

Dr. Elias H. Bartley said that his worst trouble had been in getting the children to partake of this food; in fact, he had only succeeded in getting 2 children to take it out of 6 or 8 who had severe infections and who were brought to the nursery.

In private practice, however, he had tried it with some success. He believed that in those children who would take it acute troubles would be benefitted unless they were due to lactic, or lactobutyric, fermentation. At best it can only be used for a short time. He said he had not tried it with healthy babies. He could see no reason why a sour milk should be fed to a healthy baby.

Again the reports of the bacteriological examinations of the tablets at the Hoagland Laboratory had been disquieting, for almost all the cultures were shown to be mixed cultures, and not pure cultures. Bacteriological examinations were made of all of the tablets that could be found in the market, and very few of them were found to be what was claimed for them. They were not pure, but mixed cultures.

So far as his experience went, the use of milk does help to reduce the amount of fermentation in the intestinal canal, and this is believed to be due to the milk sugar, which produces a small quantity of lactic acid continuously. Some may recall the fact that twenty-five years ago this fad came up but in another form, and it had some value. Lactic acid in 5 per cent. solution was given by the mouth in cases with the green curdy stools of summer. Dr. Bartley said he used this for two or three seasons and he was sure with success.

Lately he said he had used whey slightly soured with lactic acid; he could not claim this to be the equivalent of the other preparation, because lactic acid was readily soluble and probably must disappear in the upper part of the small intestine. However, he thought he could get as good a result with the lactic acid whey as with the administration of sour milk.

Dr. Herman Schwarz said that the method of preparation of the buttermilk described by Dr. Kerley was not likely to produce a good buttermilk, and thus the results obtained, whether good or bad, could hardly be compared to those of a fresh uncontaminated buttermilk. Any kind of tablets added to milk, and this mixture allowed to stand for twenty-four or forty-eight hours, would hardly be the thing to give to infants in the summer time. Further, the dilution of the buttermilk was hardly in accordance with the method of giving it as prescribed by the Dutch and German authorities. The addition of sugar to food while the infant was suffering from some acute intestinal condition might also, according to Finkelstein, be the cause of some of the acute symptoms following its administration.

The Treatment of Eczema of Infants and Young Children by Thyroid. — Eason (*Scottish Medical and Surgical Journal,* May, 1908) briefly reports a series of consecutive cases of eczema in young children successfully treated by thyroid. In the first case, fourteen months old, the baby had suffered from eczema of the face for nearly a year. This had been entirely resistant to the usual applications and internal treatment, nor was hospital treatment more efficacious. Two and a half grains of a thyroid tablet was given daily. In a little more than one month the child was entirely well. His cure persisted for nearly a month, when the disease showed a tendency to recur. The second course of thyroid was followed by a permanent cure. The four other cases gave similar results.—*Therapeutic Gazette.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

Report of Meeting held March 9, 1909.

J. CLAXTON GITTINGS, M.D., PRESIDENT.

SPLENIC ENLARGEMENT.

DR. H. H. JENKS showed a white child, five years old, with history of cough and dyspnea for three months. Child was well nourished, small for her age; skin lemon yellow; mucous membrane pale; respiration rapid and labored, 44-50; absolute flatness and faint bronchial breathing over entire left lung except a small strip one inch in width along the left side of the spine; liver palpable 3.5 cm. below costal border in right nipple line; spleen very large, extending 11.5 cm. below costal edge in left nipple line, with notch easily felt; temperature 100° F. or less; urine shows albumin, trace, and few red blood cells. Blood count follows:—R. B. C., 2,718,000; leukocytes, 7,000; Hb., 55 per cent.; lymphocytes, 22.6 per cent.; large mononuclear, 13 per cent.; transitional, 8.4 per cent; polymorphonuclear, 49.6 per cent.; eosinophiles, 6.4 per cent. (500 cells). No malarial organisms; no T. B. in sputum; no parasites in stools. The exact diagnosis was not decided.

DR. F. B. JACOBS believed that this child had previously had rickets. He hardly thought there was fluid in the child's lung, yet percussion gave one that impression. But the dullness was not changeable. While the diagnosis remained in doubt, the tumor palpable on the left side of the abdomen was certainly the spleen.

DR. J. M. SWAN said that he had been interested in the study of the blood of the patient just shown, which he was able to make through the kindness of Dr. Jacobs. There was quite a range of possibilities from which to select a name for the condition found. The blood picture might be found in malarial cachexia, in splenic anemia, in tuberculosis of the spleen or in malignant disease of the spleen. Splenic anemia, or its later stage, Banti's disease, was probably the proper name to give the condition.

DR. JENKS added that there was albumin in the urine, and blood in the sputum, urine and feces.

THE SUBCUTANEOUS INJECTION OF SEA WATER.

Dr. Theodore Le Boutillier read a paper on this subject, exhibiting eight children under treatment for various diseases by this method. (See p. 352.)

In answer to Dr. Hand's question, Dr. Le Boutillier said that no tubercle bacilli had been found in the child with supposed tuberculosis.

Dr. M. B. Hartzell said that this report would have been more convincing had mercury not been used in addition to the sea water treatment. He admitted that he could not think of taking the subject seriously.

Dr. Gittings noted that the specific cases had also been given mercury, and wondered whether all the cases had had other treatment also. The value of such a treatment could only be finally determined by much experience on the part of many observers.

Dr. A. H. Davisson asked whether Dr. Le Boutillier thought these children got water by these injections that they would ordinarily obtain by drinking, did they not neglect to do this.

Dr. S. McC. Hamill asked what changes were made in the hygiene and diet of these cases at the time treatment was begun. The improved physical conditions which were evident in some of these cases were frequently brought about by a general hygienic regulation. It was important, in determining the value of any treatment, to eliminate all possible outside influences which might have worked toward the accomplishment of successful results.

Dr. Le Boutillier said that the tuberculous case had been under good treatment before the sea water injections were begun, but she had only gained weight afterward. The cases of malnutrition had been breast-fed before treatment and since also. The diet and hygiene were important and every mother was instructed in these points, whether sea water treatment was given or not. These cases had failed to improve until the injections of sea water were given. In the syphilitic cases mercury had been given since birth, long before sea water was used; but the improvement only started after the sea water injections.

ANGIONEUROTIC EDEMA.

Dr. S. Seilikovitch made this report. (See page 372.)

Dr. Hartzell said that angioneurotic edema was first described as a giant urticaria. It was commonly regarded as akin to urticaria, but while the latter was frequently due to articles of food or drugs, angioneurotic edema never had been found due to any such cause. Besides, there were many cases in which no urticaria was ever found. Urticaria itched, while angioneurotic edema was accompanied by no subjective symptoms. One of the common causes of angioneurotic edema, beside heredity, was exposure to cold, such as going out of doors in winter, and in certain cases eating ice-cream or drinking ice-water would cause swelling of the tongue. The coal tar products might produce urticaria, but never angioneurotic edema. The latter frequently occurred at night. The case reported was remarkable on account of the early age of the patient. Angioneurotic edema might attack the mucous membrane also, even of the larynx and tongue. Diet had no effect in treatment. Sodium salicylate was of value internally, diminishing the number of attacks. Calcium chloride might be tried also, on theoretical grounds.

Dr. Seilikovitch added that quinin seemed of value, especially when the swelling occurred periodically. He believed that the cause of death in his case was edema of the larynx.

INFANTILE PARALYSIS.

Dr. S. H. Cross reported a case, with complete and rapid recovery. The boy went to bed well December 15th, but awoke during the night complaining of pain in the right knee, and in the morning it was found that he could not move his right leg. Examination showed no tenderness or stiffness; knee jerk decreased on right side; complete paralysis of the exterior muscles of the thigh. At the end of a week he could stand alone and walk with some assistance. In spite of an attack of acute tonsillitis at this time, he continued to improve. On December 30th, the right thigh was one-quarter of an inch less than the left in circumference. By the middle of January he had perfect use of the leg and measurements were equal. On March 8th, both thighs measured twelve inches, an increase of one inch on each side, and all muscles reacted to the faradic current.

Dr. Herbert Fox said that exposure to cold and some of the acute exanthemata were said to predispose to, and to cause this disease, but this was not borne out by a study of the epidemic form. The difference between the epidemic variety and the sporadic cases of this disease consisted in the greater prominence of the symptoms and signs of acute infection, the quite regular course of the epidemic type and the fact that the paralysis more often cleared up rapidly in this form. The abortive or atypical cases were numerous and were important from a hygienic standpoint, because they were most difficult to follow. The bacterium had been found in the spinal fluid of cases both in Norway and in this country, but the injection of cultures into experimental animals had not as yet produced poliomyelitis. In a number of cases the spleen had been enlarged during the preparalytic febrile period. In the vast majority of cases studied there had been evidences of increase of spinal fluid with some pressure, but no pronounced irritative meningeal symptoms.

DR. GITTINGS thought that the cause of anterior poliomyelitis would eventually be shown by the bacteriologists.

DR. CROSS, in answer to Dr. McKee's question, said that the case had not shown any irritative motor phenomena or tenderness over the nerve trunks. No blood examination had been made.

THE SURGICAL ASPECTS OF MECKEL'S DIVERTICULUM.

DR. J. B. CARNETT reported a case of Meckel's diverticulum contained in an inguinal hernia in a boy of twelve years. Attacks of constipation and abdominal pain began when patient was two months old, and recurred at intervals over a period of four months and were ascribed to a right inguinal hernia. After wearing a truss for one year the hernia was considered cured. When twelve years old he was struck over the right inguinal canal by a baseball. A few days later he began to have attacks of colicky pain, tympanites and constipation; later he discovered hernia of right inguinal canal. Severity of symptoms depended on the size of the hernia, which disappeared on lying down. The right testis was found incompletely descended and disappeared into inguinal canal on reduction of hernia.

Operation was performed three months after the hernia was noticed. A Meckel's diverticulum having a length of two and one-half inches and a diameter of the same size as the ileum was found in the congenital sac. The tip of the diverticulum was adherent to the sac wall. Diverticulum excised and its stump inverted into the ileum. Radical cure of the hernia by Bassini's operation. Good recovery followed, with no return of symptoms.

Pathological examination of excised specimen revealed catarrhal diverticulitis.

Dr. Carnett said that Meckel's diverticulum was found at autopsy in 2 per cent. of human beings. In the absence of complications it did not give rise to any symptoms. The more common lesions by which it manifested itself clinically, in the order of frequency, were intestinal obstruction, diverticulum open at the umbilicus, diverticulitis and hernia. The symptoms and treatment of these lesions were then discussed.

Dr. W. F. Guilfoyle, by invitation, then demonstrated a number of specimens of Meckel's diverticulum.

CHRONIC ECZEMA OF INFANTS. — (*Münch. med. Woch.*, January 19, 1908.) Feer says that real chronic eczema of infants is a constitutional disease and must be differentiated from various forms of dermatitis that likewise affect infants. The etiology of such eczema depends upon two factors—congenital predisposition and feeling. Overfeeding and chronic constipation are the usual concomitants of the seborrhoic form of eczema. Improvement and cure usually follow the change from pure milk diet to mixed diet at the end of the first year. The second variety of eczema occurs almost exclusively in artificially-fed children. Such children are weak, pale and thin. The eruption is not as strikingly evident as in the first form, and consists of scattered patches of dry, scaly infiltrated lesions that may be found over the whole body. While local treatment of these forms of disease must be used in every case to make the children comfortable, the cure depends not upon this treatment, but upon changes in the diet of the children. Reduction of milk is the principal point of managing these cases, and carbohydrate food must be given to make up the deficiency in the foodstuffs. After the fourth month of age this is very easy, as the child can be fed on various cereal preparations and also given fruit juice. In later months the albumin of eggs must be avoided, as it is as badly borne as the milk proteids. Whey mixtures may be used in cases where the child is too young to take any other food but some form of milk. The whey may be modified with sugar and cereal gruel, a diet with which Finkelstein had great success in the treatment of eczematous children. Feer concludes his article with the report of a number of cases treated according to the methods outlined above.—*Medical Record.*

CURRENT LITERATURE. 387

Abstracts in this Number by

Dr. F. H. Bartlett. Dr. Henry Heiman.
Dr. A. W. Bingham. Dr. C. D. Martinetti.
Dr. R. S. Haynes. Dr. Linnæus La Fétra.
Dr. M. Nicoll, Jr.

DISEASES OF THE EYE.

Parsons, J. Herbert: Ocular Complications of Scarlet Fever and Diphtheria. (*The Practitioner,* January, 1909, p. 22.)

In scarlet fever ocular complications are uncommon. When present, acute conjunctivitis is probably due to the introduction of epithelial scales into the eye from the eyelids or to infection by the streptococcus or less often by the diphtheria bacillus. The most important ocular complications in scarlet fever are secondary to the scarlatinal nephritis and of these, uremic amaurosis without ophthalmoscopic signs is the commonest. Optic neuritis is rare.

In diphtheria the commonest form of eye disease is membranous conjunctivitis, and this may be due to many other organisms beside the diphtheria bacillus. A special cause of error in the bacteriological diagnosis is the frequent presence of the bacillus Xerosis in the conjunctival sac, a bacillus which is in form identical with the Klebs-Loeffler bacillus and is not absolutely distinguishable from it even by cultural experiments. Moreover, the grade of severity of the conjunctivitis is little guide to the probability of the presence of the diphtheria bacillus. Neisser's method of staining, though not infallible, is the most trustworthy method at present of distinguishing between the diphtheria and Xerosis bacillus.

In diphtheritic conjunctivitis there is a membrane on the conjunctiva of the lids and the lymph stasis is largely responsible for the great liability to corneal complications. Beside these local conditions the general condition is seriously affected. There is fever, and albumin is often present in the urine, a fact which may be of diagnostic value. Though the contagion is generally derived from the throat, it is astonishing how seldom there is faucial diphtheria.

Serum treatment is the most efficacious measure and in addition to its injection the serum should be instilled locally into the eye. A curious fact is that conjunctival diphtheria is very rarely followed by paralysis.

Although paralyses are rare after conjunctival diphtheria they frequently occur after diphtheria of the throat and have been seen after affection of the vagina and wounds by the diphtheria bacillus. The ciliary muscle is often involved. Paralysis of accommodation usually comes on three or four weeks after the commencement of the attacks, the limits being from two days to ten weeks. The onset is usually gradual, giving rise to increasing difficulty in reading and both eyes are equally affected. The patients are almost without exception under fourteen years of age. It is exceptional for the iris to be affected, so that diagnosis is dependent upon subjective tests. In children, therefore, it is imperative that not only the distant, but also the near vision should be tested in all cases before instilling a mydriatic.

Paralysis of the extrinsic ocular muscles sometimes occurs after diphtheria and sometimes one or both recti muscles are seen. Such paralyses are rapid in their onset, only partial and recover quickly. Complete paralysis of all the branches of the third nerve is very rare, having been reported only once.

LINNÆUS LA FÉTRA.

DISEASES OF EAR, NOSE AND THROAT.

YEARSLEY, MACLEOD: THE EAR COMPLICATIONS OF SCARLET FEVER AND DIPHTHERIA. (*The Practitioner,* January, 1909, p. 27.)

In the 1906 report of the Metropolitan Asylums Board out of 4,937 cases of diphtheria 5 per cent had otitis and $^1/_{10}$ per cent., mastoid abscesses. As regards scarlet fever for the same year, of 17,829 cases 13.2 per cent. had otitis and 0.68 per cent. had mastoid abscesses. At the Willard Parker Hospital in 1896, among 386 cases of scarlet fever there was otitis in 73 cases, 33 of which were bilateral; and in 1899, of 387 cases there were 43 of otitis, 23 of which were bilateral, so that out of these 773 cases, nearly 20 per cent. had otitis, and of these one-third were on both sides.

The ear complications of diphtheria fall in four groups: (1) Diphtheritic inflammation of the external auditory meatus;

(2) diphtheritic inflammation of the Eustachian tube and middle ear; (3) acute catarrhal and purulent inflammations of the middle ear without the formation of membranes; (4) internal ear affections. In epidemics primary diphtheria of the meatus may develop, but primary diphtheria of the middle ear is very rare. Secondary involvement of the middle ear is, however, common, usually developing at the crisis of nasopharyngeal diphtheria. The membrane may be found extending to the mastoid cells and may lead to partial or complete necrosis of the labyrinth. Apart from the destruction of the labyrinth by suppuration a few cases of nerve deafness have been recorded. They are usually of the nature of postdiphtheritic paralysis. The treatment of diphtheritic inflammation of the external ear should be strictly antiseptic.

Middle ear inflammation is the most serious complication of scarlet fever and is due to various factors: (1) The toxins of the disease; (2) extension of inflammation from the throat; (3) the general weakness induced by the fever. As regards the bacteriology, the streptococcus pyogenes is most commonly found, although staphylococci and the pneumococcus and pneumobacillus are also found. The Klebs-Loeffler bacillus has been obtained in later cultures and appears to develop when the system is weakened. Aside from the middle ear complications with the danger of mastoid involvement, the internal ear may be attacked without suppuration by the toxins of scarlet fever resulting in nerve deafness. Marked deafness without discharge, especially when accompanied by vomiting, vertigo and nystagmus, should call attention to this affection.

The treatment of the middle ear complications of scarlet fever and diphtheria is of the greatest importance. It cannot be too strongly insisted that large tonsils and adenoids should be removed and other forms of nasal obstruction corrected as prophylactic measures. Every effort should be made at the time of the disease to keep the upper air passages clean and free from secretions. Reliance must be placed upon the destruction of the local toxin factory or the weakening of its operatives so that its output is lessened. Meredith Young found that swabbing was of the greatest value, making use of the following solution: ℞. Boric acid, 1 ounce; alcohol, 2½ ounces; glycerin, 8 ounces. Formamint tablets were also helpful as an antiseptic lozenge. Douching the nose with sulphate of zinc solution, 1 or 2 grains to the ounce, was also found of great value, but the douching must be done in the gentlest manner possible, and should be discontinued when the conditions improve.

At the first onset of middle ear symptoms hot antiseptic irrigations with the application of dry heat and the use of leeches should be tried. But if there is no abatement in twelve, or, at the most, twenty-four hours, the membrane should be widely incised; for there is an infection of the whole middle ear tract accompanied, where the tract is bony, by more or less osteitis. After incision antiseptic irrigation with 1-2,000 bichlorid of mercury solution, combined with instillations of alcohol, must be continued. In scarlet fever hospitals an otologist should see all the cases in order to prevent mastoid diseases.

As regards deaf-mutism, diphtheria is seldom reported as its cause, but scarlet fever gives rise in various countries to from 1½ to 27 per cent. of the cases of acquired deaf-mutism.

L. E. LA FÉTRA.

PATHOLOGY.

VOGT, H.: ANATOMICAL STUDIES IN MONGOLISM. (*Archiv. für Kinderhk.*, Vol. XLIX., p. 329.)

Seven cases were studied by the author. No inflammatory changes of any kind were seen. There were evidences in the cerebral cortex of incomplete and delayed development of the nervous tissue. No special tracts or regions were affected. These changes are similar to those found in other forms of idiocy. Specific pathologic changes were not found.

HENRY HEIMAN.

BRUN, V., AND MOMIGLIANO, B.: RESEARCHES ON THE CALMETTE TUBERCULIN REACTION. (*Riv. d' Clin. Ped.*, November, 1908.)

The authors chose for their researches only cases affected by surgical tuberculosis, this class having been hitherto neglected. They employed watery solutions of tuberculin at 1:100, 1:200, 1:500 injected at intervals of one week, taking every precaution to insure absorption by the conjunctiva. They treated thus 84 cases. Of these, 40 were admittedly tubercular and 39 promptly reacted; 38 other doubtful cases did not react at all, nor did the remainder afterward found to be streptococci infections.

In the majority of cases the intensity of the reaction was proportionate to the gravity of the tuberculous process. The experiments proved also to be comparatively harmless and the results compare favorably with those of other recent investigators.

C. D. MARTINETTI.

PACCHIONI, D.: THE OSSIFICATION OF CARTILAGE IN NORMAL CONDITIONS AND IN RACHITIS. (*Riv. d' Clin. Ped.,* December, 1908.)

The author reviews at length the work of Pfaundler on the subject and his own experiments in the same line. Pfaundler holds that cartilaginous tissue under the influence of age becomes decomposed and becomes passively calcified. Pacchioni, on the contrary, demonstrates that cartilage takes a most active part in ossification, causing, thanks to its active metabolism, an accumulation of the material necessary for the formation of osseous tissue. Regarding rachitis, both Pfaundler and Pacchioni admit that in this condition cartilaginous cells are affected by defective metabolism, and this, of course, prevents the regular formation of bone. The morbid process appears to have its origin in the nucleus and protoplasm of the cells. C. D. MARTINETTI.

MEDICINE.

DELÉARDE AND JEAN MINET: THE FAMILY SPASTIC PARAPLEGIA SYNDROME. (*L'Echo Méd. du Nord,* March 29, 1908, p. 153.)

An exhaustive clinical report of the case of a girl three and a half years of age afflicted with progressive spastic paraplegia. The child was the member of a family three of whom had died of the same disease, the cause of which has not been definitely determined. It is regarded not as a pathological entity, but as belonging rather to a group of allied conditions whose clinical phenomena vary with the part of the nervous system attacked. Thus if the cerebellum be involved hereditary ataxia of Pierre Marie is produced, together with certain symptoms of Friedreich's ataxia and some forms of family spastic diseases. If the posterior columns and cerebellum, Friedreich's ataxia; if the cerebrospinal motor system, spastic paraplegia with purely spinal, bulbospinal or bulbo-cerebrospinal manifestations. If the optic tracts and cerebral cortex are involved, amaurosis with idiocy; if the spinal motor cells, chronic hereditary poliomyelitis will result.

M. NICOLL, JR.

MENGONI, E., ZANNONI, T.: CASE OF SURGICAL SCARLET FEVER. (*Riv. d' Clin. Ped.*, December, 1908.)

During a light epidemic of scarlet fever the authors were called to see a man wounded on the right thigh. There was marked inflammatory reaction. Subsequently an abscess formed, but the wound was closed after four weeks. During treatment, however, a typical scarlet fever rash developed, starting from the wound and spreading all over the body. Desquamation followed as usual, but lasted only six days. Every other symptom had been present. C. D. MARTINETTI.

KASSOWITZ, MAX: RICKETS. (*Jahrb. für Kinderhk.*, March 1, 1909, No. 69, Vol. III., p. 251.)

The author reasserts his previously expressed view that rickets is a chronic inflammatory process of the growing bone and cartilage, and not a constitutional disease. He denies the theory that rickets is due to a disturbance of metabolism, for in his experience most of the children showing craniotabes, rosary and enlarged epiphyses, do not suffer from anemia and are usually in good health. In fact, in some rachitic children the growth is unusually rapid, and this the author thinks may be a contributory factor in the production of the rachitic changes in the bones. That rickets is not primarily due to gastrointestinal disturbance is shown by the fact that the disease is most frequently seen during April and May. The number of cases diminishes markedly during July and August. The insomnia, irritability and sweating about the head do not precede, but follow, the onset of the changes in the cranial bones. The tenderness of the extremities and the laxity of the joints are due to the extension of the inflammatory changes from the bones and cartilages to the joint capsules and ligaments. Ammoniacal urine is frequently present in rickets, but is due to the fermentation of the urine on the diapers. The urine drawn by catheter is not ammoniacal. The inhalation of ammonia from decomposed urine may be a factor in the production of rickets. The chief etiologic factors are a congenital or acquired predisposition and the inhalation of effete matter from a vitiated atmosphere. HENRY HEIMAN.

POYNTON, F. J.: PYOCARDIUM IN CHILDREN UNDER TWELVE YEARS OF AGE. (*British Medical Journal,* August 15, 1908, p. 365.)

In young children pyocardium is almost invariably associated with pulmonary disease and this is most commonly pneumococcal in origin. Of 100 fatal cases, 83 per cent. occurred before the fourth year of life was completed, and two-thirds between the ages of one and three years. About 60 per cent. are associated with empyema, and about 40 per cent. with pneumonia or acute pleurisy. Diagnosis is very difficult because of the usual absence of pericardial friction, the presence of severe pulmonary disease, and the fact that accurate observations in small children are frequently very arduous undertakings.

Acute cases, about 20 per cent., run their course in about four weeks, and the onset is usually abrupt and pneumonic in type. Subacute cases, 50 per cent., lasting from four weeks to six months, are characterized by cough, pleural pain, and wasting, and in some cases vomiting and diarrhea. Chronic cases, 17 per cent., with insidious onset, last from six months to over a year, and sometimes are marked only by gradual failure of health and strength with wasting. Most of these symptoms are in no way localizing. Unusual symptoms attracting especial attention are: Extreme illness with lividity; panting respiration and excessive dyspnea; curious irregular rises in temperature, accompanied by rapid and feeble action of the heart; orthopnea and syncopal attacks.

The most important signs are: Progressive muffling of the heart sounds synchronous with enlargement of the cardiac area, together with marked percussion dullness over the pericardium and sometimes posteriorly in the interscapular region. A rapid and extensive increase of the cardiac dullness upward. The pear-shaped outline of a distended pericardium. Abrupt transition from the dullness of fluid to resonant lung tissue. A wavy and diffuse pulsation to the left of the sternum.

There are remarkable clinical distinctions between rheumatic and pneumococcal pericarditis. In pneumococcal pericarditis frequency greater under four years, endocarditis most exceptional, dilatation not frequent or considerable, empyema or pneumonia the rule, tendency to pus formation and the absence of pericardial friction, arthritis exceptional and the micrococcus is a lanceolate, encapsuled diplococcus. In rheumatic endocarditis frequency rare under five, endocarditis is almost and dilatation is invariable, empyema does not occur, there is tendency to resolution and friction is present, arthritis exceedingly frequent, and the micrococcus is smaller, not encapsulated, and is resistant in its growth.

The prognosis of suppurative pericarditis in small children is exceedingly grave. Surgical intervention at present offers the best chance of successful treatment. A. W. BINGHAM.

WILLIAMS, MARY H.: PULMONARY TUBERCULOSIS IN CHILDREN. (*British Medical Journal,* February 13, 1909, p. 387.)

Phthisis is one of the most common diseases of childhood, and, among those who die of it at the ages when it causes the highest mortality, the majority have contracted and suffered from the disease in childhood. This view is supported by death and morbidity statistics.

In the immense majority of cases tuberculosis is not contracted by inhalation, but by the ingestion of bacilli or bacilliferous products by way of the intestinal mucosa. The tendency of the disease in these cases is to cure.

Important early symptoms are night sweating, morning anorexia, and fatigue. It is urged that the greatest care be taken to detect these cases early by the medical school inspectors and, when found, that the children be sent to open air schools.

A. W. BINGHAM.

BROADBENT, SIR JOHN F. H.: THE HEART IN SCARLET FEVER AND DIPHTHERIA. (*The Practitioner,* January, 1909, p. 13.)

Notwithstanding the general impression that endocarditis is a main complication of scarlet fever, the author finds that in London out of 22,092 cases of scarlet fever, endocarditis occurs in only 0.58 per cent. Pericarditis is still more uncommon, the percentage being about $^1/_{10}$ per cent. Both endocarditis and pericarditis are most apt to occur in association with rheumatism following scarlet fever. Notwithstanding the frequent occurrence of a systolic mitral murmur, true endocarditis is found in very few of such cases.

The most striking feature concerning the circulation is the acceleration of the pulse, which is out of all proportion to the height of the fever, and is particularly marked in children in whom it is apt to persist long after the fever and other symptoms have subsided. It is probably due to some disturbance of the nervous mechanism of the heart by the toxins of the disease.

In diphtheria the changes produced in the heart consist mainly of granular and fatty degeneration of the muscle fibers and of the muscular coats of the blood vessels. But these changes do not satisfactorily explain the attacks of cardiac syncope which at times occur in diphtheria. Degenerative changes in the pneumogastric nerve probably account for the tendency to cardiac syncope, which is all the more apt to take place because of the degeneration in the heart muscle. As to treatment, prolonged and absolute rest in bed is essential when there are disturbances of the rhythm, rapid heart action or shortening and weakening of the first sound. The *Bruit de Galop* is a grave danger signal. Small, easily digestible meals with the use of strychnin hypodermatically are recommended.

LINNÆUS LA FÉTRA.

HUNTER, WILLIAM: COMPLICATIONS OF SCARLET FEVER. (*The Practitioner*, January, 1909, p. 1.)

Although scarlet fever has up to the age of five years a mortality of only about 16 per cent., while measles has for the same ages a much higher death rate, reaching in patients under two years as much as 40 per cent., there is justly a greater apprehension by the public of scarlet fever because of its complications. Its complications may be conveniently divided into two groups, those connected with scarlatinal infection itself and those connected with the accompanying septic infection. A table of the occurrence of complications in 648 cases shows that of the local conditions secondary adenitis was the most frequent, appearing in 24 per cent., while of the general complications albuminuria was present in 30 per cent. and rheumatism in 20 per cent. of the cases. In this series the number of deaths was about 1 per cent.

To prevent secondary angina and adenitis the author lays particular stress upon the prevention of oral sepsis, and advises removing, so far as possible, every trace of oral infection in the mouth by daily swabbings of the teeth and gums with 1-40 carbolic solution. By this practice the author has reduced oral sepsis to about one-half in four years.

In 534 cases albuminuria was present in 30 per cent.; in these it occurred in 43 per cent. during the first week. In 60 per cent.

of cases it lasted less than one week, and in only a small number did it last over three weeks. There seemed to be no direct connection between the albuminuria and the secondary adenitis. Nephritis occurred in only 2.7 per cent. of 640 cases. It developed in these 9 cases at various times between the eighteenth and thirty-eighth days of the disease. Its most striking feature is its insidious and treacherous character; for it is not usually the albuminous cases that develop nephritis. The first symptom that the kidneys are involved may be uremic convulsions. Exposure to variations of temperature and allowing patients to get up too soon are thought by the author to be the two most important factors.

LINNÆUS LA FÉTRA.

HYGIENE.

STÄUBLI, CARL: A CONTRIBUTION TO THE BIOLOGIC RELATION BETWEEN MOTHER AND CHILD. (*Archiv. für Kinderhk.*, Vol. XLIX., p. 321.)

The author studied 51 guinea-pig fetuses from 25 litters. Typhoid agglutinins were found in all the fetuses whose mothers were inoculated with typhoid bacilli some time before birth. In none of the untreated guinea-pigs, newborn or older, were agglutinins found. The agglutinins were not derived from the mother's milk. The immunity was of a passive nature transmitted through the placenta.

HENRY HEIMAN.

AMBERG S., AND MORRILL, W. P.: METABOLISM EXPERIMENT ON A BREAST-FED INFANT, WITH REFERENCE TO THE AMMONIA COEFFICIENTS. (*Jahrb. für Kinderhk.*, March 1, 1909, No 69, p. 280.)

The authors' conclusions are as follows:—

(1) A relative reduction of proteids in the diet of a breast-fed infant produces an increase in the ammonia coefficients; and the nitrogen output in the form of uric acid and creatinin.

(2) The increase in the ammonia coefficients is dependent to a certain extent on the ratio of the fats to the proteids in the diet.

(3) The indispensable proteid minimum of a mixed diet is less than the quantity of proteid used up by the body in starvation.

(4) The quantity of urine excreted by a normal infant calculated on the basis of the ingested fluids is variable and may be less than 68 per cent.

(5) With increasing age from the first week to the second or third month, there is a decrease in the ratio between nitrogen retention and nitrogen ingestion and absorption.

HENRY HEIMAN.

THERAPEUTICS.

FENDLER, AMELIA M.: PERTUSSIS.—A NEW METHOD OF TREATMENT, WITH REPORT OF CASES. (*The American Journal of Obstetrics,* June, 1908.)

A report of 3 cases treated by intralaryngeal injections of 10 to 25 drops of a 2 per cent. solution of antipyrin. The first case was cured in seventeen days, the second in thirteen and the third in seven. Applications were made through Yankauer's glass instillation tube.

R. S. HAYNES.

JOVANE, A., AND PACE, C.: RICKETS AND THE SUPRARENALS. (*Archiv. für Kinderhk.*, Vol. XLIX., p. 375.)

Eleven cases of rickets were treated with daily subcutaneous injections of adrenalin in increasing doses of $^1/_{10}$ to 1 c.cm. of the $^1/_{1000}$ solution. In 2 children intolerance was shown by vomiting, cyanosis, profuse sweating, tachypnea and increased pulse tension. This intolerance, however, disappeared when the dose was reduced. In all the children there was noticeable increase in muscular power, as shown by the ability to stand or even walk. In some the appetite and nutrition showed improvement. A mild albuminuria ($^1/_{25}$ per cent.) occurred in 5 cases. When the treatment was discontinued the muscular asthenia returned, showing that the improvement was only temporary. The authors examined the suprarenals of 7 cases of rachitic dystrophy (in young rabbits) produced by intravenous injection of alcoholic extracts of fecal matter from rachitic infants and found no macroscopic or microscopic changes. In 6 young dogs, in whom one suprarenal was successfully removed, the one change in the bones was the marked dilatation of the vessels in the marrow, a condition which is probably the result of lowered blood pressure. As a result of these clinical and experimental studies the authors are of the opinion that there is no intimate connection between rickets and the adrenals. HENRY HEIMAN.

INFANT FEEDING.

ROTCH, THOS. M., AND MORSE, JOHN L.: RECENT ADVANCES MADE IN THE SCIENTIFIC STUDY OF FOOD STUFFS AND THEIR APPLICATION TO THE NUTRITION OF INFANTS. (*Boston Medical and Surgical Journal,* February 25, 1909, p. 243.)

The glycerides of the higher fatty acids predominate in cow's milk as compared to human milk, while the volatile fatty acids are in larger proportion in the latter. The milk of Holsteins contains a lower percentage of these glycerides than does that of Guernseys and Jerseys and clinically is more easily digested. For purposes of nutrition the percentage of fat should not be lower than 1 and not higher than 4 per cent. However, no hard and fast rule can be formulated, for each child should be studied by itself. Butyric acid fermentation, which results from the breaking up of the glycerides of butyric acid, takes place more readily in Guernsey and Jersey milk than in Holstein. The emulsion of Holstein milk resembles more closely that of human milk. It is not only much finer, but also more stable and more easily reformed when broken up.

Dextrose is the only form of carbohydrate which is directly assimilable into the circulation. Certain peculiar forms of fermentation determine which carbohydrate shall be given. Where there is an excess of lactic acid, maltose should be given, and where an excess of butyric acid, lactose. Starch serves two functions in the food—it makes the casein precipitate finer and it has a nutritive value.

There is no proof that qualitatively the proteids of cow's milk differ from those of human milk. The authors give a table showing the combinations of soluble proteids (lactalbumin) and casein with fat percentages from 1 to 4 and sugar percentages from 4 to 7.

Casein can form combinations with alkalies and with acids. Citrate of soda, which acts like an alkali in the digestion of casein, may be used instead of an alkali. It also prevents the action of the rennet and results in the formation of soft curds if added in strength of .4 per cent. The addition of an alkali favors the production of hydrochloric acid, and if sufficient be added, relieves the stomach of the digestion of proteids. Lime water or bicarbonate of soda may be used. Lactic acid bacilli favor the digestion of the proteid and limit saprophytic fermentation.

If the physician understood the nature of digestive disturbances in infancy and the means of correcting the same by the proper combinations of the food elements, there would be little need of patent foods. F. H. BARTLETT.

BOOK REVIEWS.

PARCIMONY IN NUTRITION. By SIR JAMES CRICHTON-BROWN, M.D., LL.D., F.R.S., Lord Chancellor's Examiner in Lunacy, London. Pp. 111. New York: Funk & Wagnalls Co., 1909.

This little book cannot fail to attract everyone who is interested in dietetics. In contrast to Chittenden, who represents the ultra-scientific standpoint, and Fletcher, who represents the standpoint of the faddist, the author presents the matter in the light of practical personal observation. It is refreshing to be told, although we all surmised it, that human beings have not for thousands of years been daily committing flagrant dietetic sins against their own bodies in eating what a reasonable appetite demands and in exceeding by a good deal the lately established proteid requirements. What interested the reviewer particularly was the question raised by the author whether the standards laid down by the observations of Chittenden, although they could not be controverted at present, would stand the test of time and whether the benefits of a very reduced proteid diet could be determined solely by weights and measurements of the moment. He considers that the effects of diet upon the individual in later years and upon his children and his children's children will have to be taken into account before a radical departure from the established standards can be given consideration.

TRANSACTIONS OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA. Third Series, Vol. XIII. Pp. 256. Philadelphia: Printed for the College, 1908.

This volume of the Transactions contains the papers read before the College from January to December, 1908.

MISCELLANEOUS.

ANNUAL MEETING OF THE AMERICAN PEDIATRIC SOCIETY.

The twenty-first annual meeting of the American Pediatric Society will be held at Lenox, Mass., on May 27th and 28th.

A special discussion on the subject "The Position and Work of the American Pediatric Society toward Public Questions" will be a feature of the meeting. The discussion will be opened by Dr. Rotch.

The following is a partial list of the papers which will be presented at the meeting:—

Dr. Abt,	"The Irritating Effects of Cathartic Drugs on the Intestinal Mucosa."
Dr. Carr,	"Pneumococcic Infection."
Dr. Churchill,	"A Report on the Medical Work in the Juvenile Court of Chicago."
Dr. Dunn,	"Tuberculous Meningitis."
Dr. Griffith,	"The So-called Thymus Death, With an Account of Six Cases of Sudden Death in One Family."
Dr. Huber,	"Traumatic Pneumothorax." "Empyema in an Infant Eight Weeks Old."
Dr. Howland,	"Preliminary Report on Metabolism of Diphtheria."
Dr. Meara,	"A Case of So-called Congenital Malaria." "A Case of Cerebral Hemorrhage (Birth), With Operation."
Dr. Miller,	"Some Considerations Concerning Scarlet Fever, Rubella Scarlatinosa, and Duke's Disease."
Dr. Saunders,	"The More Frequent Use of Gavage in Pediatric Practice." "Danger to the Newborn from Gas Heaters."
Dr. Shaw,	"Congenital Cysts of the Liver."
Dr. Southworth,	"The Stools of the Newborn and Their Significance."

ARCHIVES OF PEDIATRICS

JUNE, 1909.

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ORIGINAL COMMUNICATIONS.

INSPIRATORY STRIDOR AND DYSPNEA IN INFANTS.*

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AND

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We all recognize the various forms of difficult, often spasmodic and stridulous breathing produced either mechanically or reflexly, by acute and subacute inflammatory conditions in the upper air passages.

We have also long recognized laryngospasm as an affection not infrequently met with during the dentition period in those infants in whom we have to deal with abnormal reflex excitability due to an impaired nutrition or to an actual toxemia.

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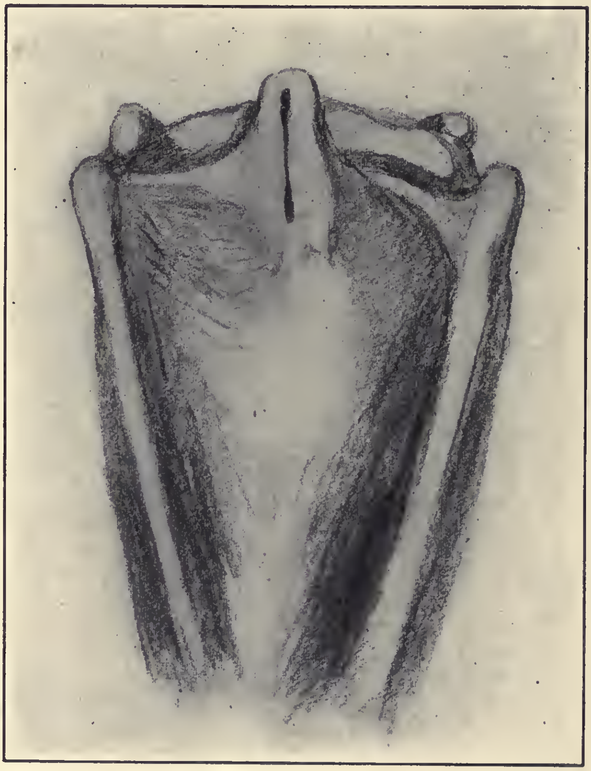
* Read before the Philadelphia Pediatric Society, February 9, 1909.

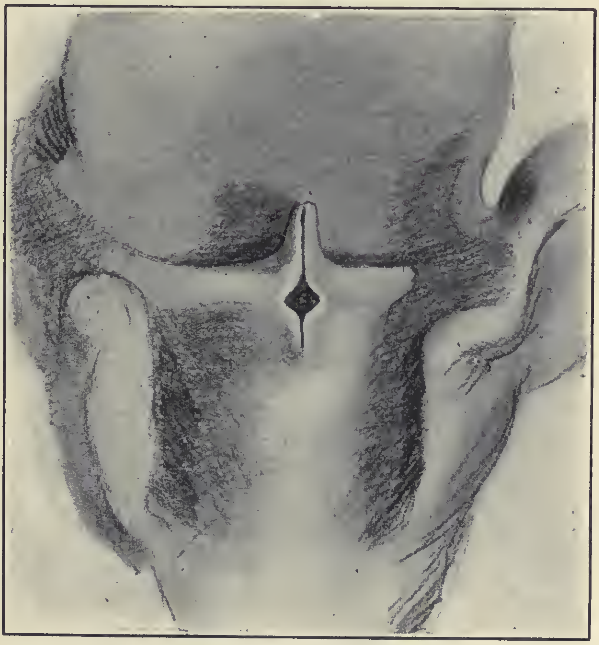
With this latter well-recognized form of laryngospasm, another form of laryngeal stridor was for a long time confounded. I refer to what is known as congenital laryngeal stridor, an affection now differentiated from laryngospasm by its occurrence in otherwise healthy children; by its early onset, generally within the first two weeks after birth; by the more or less persistence of the stridor, and by the small amount of dyspnea to which it generally gives rise.



Lee's Case, aged one year, Congenital Laryngeal Stridor.

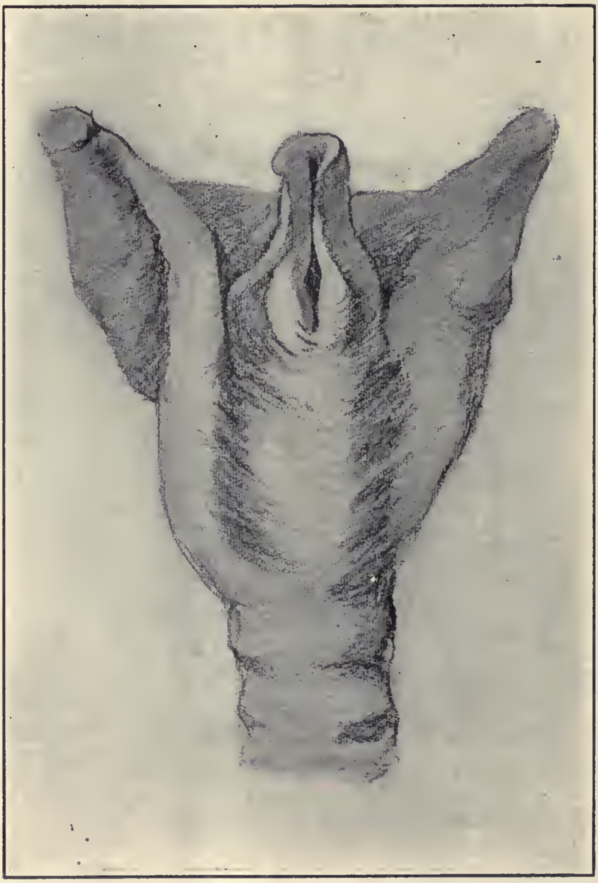
With these laryngeal affections another condition causing stridor, not infrequently referred to under the name of thymic asthma, has occasionally been associated. An abnormally large thymus may in a few rare instances be the cause of definite stridor, and in some instances of an urgent dyspnea, due to compression of the trachea.

As it has been my fortune in my professional work to meet with several cases of congenital laryngeal stridor and also of severe dyspnea, associated with an hypertrophied thymus in infants, a study of the exact conditions present in these two forms of dyspnea has had much interest for me, and I am presuming on your forbearance this evening in reporting my cases and briefly reviewing the discussion which has been going on for the past two decades regarding both congenital stridor and thymic asthma.



Reflund's Case, two and one-half months, Congenital Laryngeal Stridor.

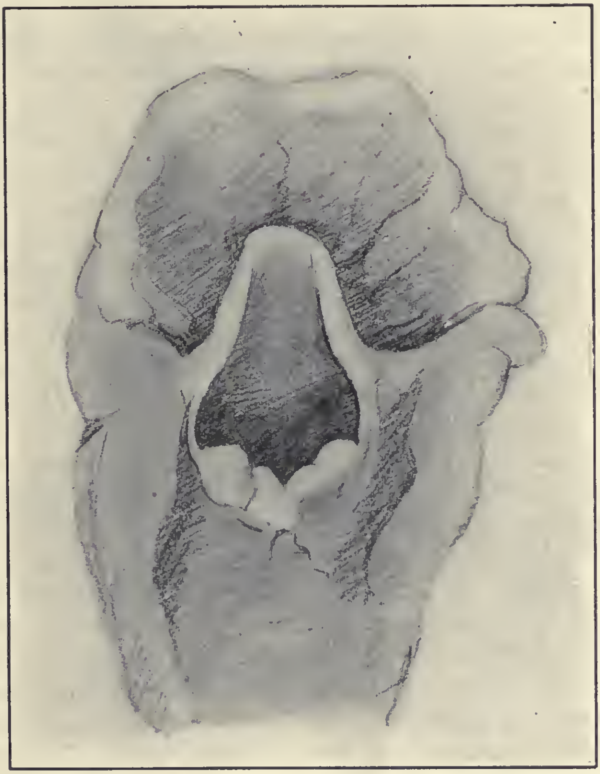
In 1892, in a paper read before the Medico-Chirurgical Society of Edinburgh, Dr. Thomson was the first to give us a clear picture of congenital stridor, which he drew as follows: An infant, healthy and normal in other respects, is noticed within the first or second week after birth to make a croaking sound with each inspiration, a sound which may rise in its note to a high-pitched crow, especially on excitement or when a sudden and more vigorous breath is taken. Expiration is generally noiseless, but may be accompanied by a short grunt when the inspiratory noise is loudest. This inspiratory noise goes on for the greater portion of the time when the infant is awake and in a few cases in a modified way when it is asleep. There are intervals of noiseless breathing even in the more severe cases, but in such an infant every reflex which intensifies the breathing invariably intensifies the sound. The child's voice, however, is clear; crying and coughing are unaffected. As a rule, breathing, though noisy, is unaccompanied by symptoms of distress, and cyanosis seldom appears, but more or less retraction of the soft parts of the thoracic walls may be seen, evidencing distinct impediment to the entrance of air.



Koplik's Case, one year, Congenital Laryngeal Stridor.

These symptoms generally increase in intensity for the first few months and then in the greater number of cases gradually lessen, disappearing before the end of the second year.

Although to Thomson we owe our first clear clinical picture of the affection, it was Lees, of London, who, in 1883, in a paper before the Pathological Society of London, first directed the attention of the profession to a condition of stenosis in the upper aperture of the larynx which he regarded as the etiological factor in a case of obstructed breathing in an infant in whom stridor had existed from birth. A condition resembling the one he then described has been found in other cases of similar stridor in which death occurred; notably in a case reported in 1898 by Refslund, of Munich, and in one by Koplik, of New York, two years ago. A similar condition has not infrequently been recognized during life. Examination of the infant by the laryngoscope is extremely difficult and very unsatisfactory, but under anesthesia by means of the bronchoscope a clear picture is obtainable.



Upper Entrance of Larynx, child three years old (after Thomson).

To understand this picture aright we must remember that the infantile larynx differs from the adult larynx not only in size and in the more yielding character of its walls, but also in the shape and comparative size of its upper entrance. The epiglottis, instead of curving upwards on its posterior aspect is only slightly raised and is distinctly folded so that its two sides are approximated, thus much narrowing the entrance way between the thin and somewhat membranous aryepiglottic folds. As the child develops, the epiglottis broadens, the aryepiglottic ligaments become widely separated, and the entrance way is much increased in size.

There is evidently a tendency, occasionally met with in a few cases, for this infantile type to be more strongly marked than is normal, and it is possible that in a few of these the condition may be still further exaggerated by the suction induced by violent inspiratory efforts. This possibility can be easily demonstrated on the cadaver of the infant by securing a metal tube in the trachea in such a way that air can be drawn through the larynx so as to resemble a strong inspiratory effort of the child. On applying suction the structures at the upper aperture are at once drawn together, the aryepiglottic folds are approximated, and the epiglottis becomes more incurved and drawn downward.

Before these facts were understood many of the earlier writers referred the stridor to a reflex spasm of the glottis, thus associating the condition with that of laryngismus. On the other hand, Robertson, of Newcastle, attributed the sound to a bilateral paralysis of the cricoarytenoids. Thomson, in presenting his clinical picture of the affection rightly ascribed the symptoms to an exaggeration of the normal infantile narrowing of the upper aperture of the larynx, and attributed its development to irregular and spasmodic breathing at birth due to imperfect coördination, the result of developmental backwardness in the centers controlling the respiratory act. This exaggeration, according to him and to Dr. Logan, gradually becomes an acquired deformity much in the same way as a deformity of the nostrils takes place in an infant with an obstruction further back in the passage, or as a pigeon breast develops as the result of adenoids.

Since Thomson's original communication on the subject, many papers describing instances of this condition have been reported; one of the most notable being that of Sutherland and Lack, of London, who reported 18 cases observed by them. They state that they were unable to detect any indications of incoördination in the way these children breathed. Respiration, so far as they could learn, was and had been, regular and even. Stridor in all cases appeared to be associated with the falling backward of an infolded epiglottis and the falling in of the arytenoid folds; a condition which they regarded as to some extent a malformation, but one which diminished with development and with the increase in the size and stiffness of the epiglottis. The vocal cords, in their opinion, played no part. McIlraith also, about the same time, reported a case seen by him in which he was able to obtain a laryngoscopic view, and on which, owing to the sudden death of the infant two months later, he was able to obtain a postmortem examination. In his opinion the stridor was purely mechanical in its origin.

Since that date several cases have been reported on both sides of the Atlantic. In America Hermann, Northrup, Greeve, Kohn, Koplik, Newcomb and Riardon have all described instances which came under their observation.

My own cases are as follows:—

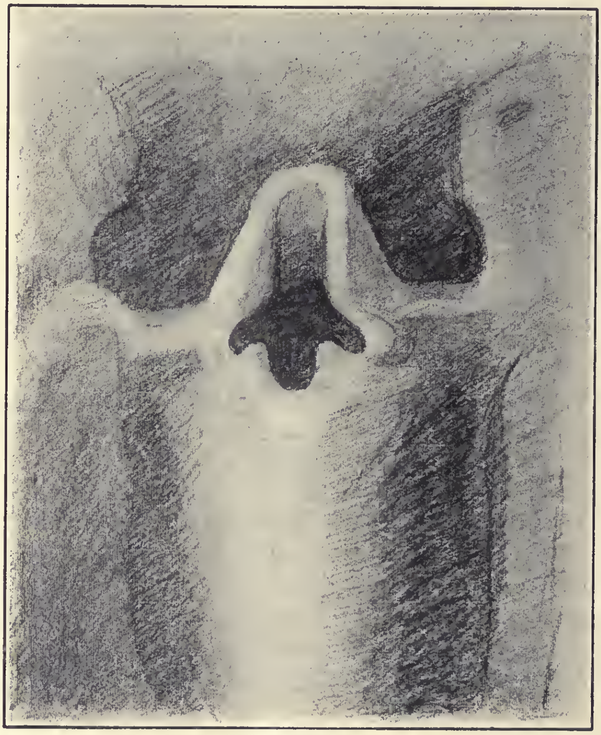
On March 26, 1885, an infant twelve weeks old was brought to my dispensary with a condition of inspiratory stridor, a condition which I had never previously seen in an infant. The following notes were taken at the time:—

"Infant, well nourished, of Polish parentage; color good; inspiration difficult and stridulous. No specific history. The mother states that except for the noisy breathing the child has been well. It has had no signs of catarrh and no cough. Noisy breathing commenced about the second week of life and has been gradually getting worse. Examination revealed no rachitic enlargements and no glandular enlargements; slight recession on inspiration was seen at the lower intercostal spaces; respiratory fremitus was present, but no râles and no abnormal dullness back or front. The abdominal organs were apparently healthy. Examination of the pharynx and tonsils was negative."

The child was referred to Dr. Major, laryngologist in the outpatient room of the Montreal General Hospital, who reported much difficulty in obtaining a view of the larynx owing to the peculiar shape of the epiglottis.

The infant returned to my dispensary three weeks later. Signs of coryza were now present; the stridor still continued, but after coughing the infant became distinctly cyanosed. Moderate sized râles were now present at both bases, chiefly on the left, where marked recession of the chest wall occurred with each inspiration; heart sounds were normal; temperature, 101°; respiration, 48; pulse, 160.

Two days later the infant was seen at its own home. Signs of bronchopneumonia were now present at both bases; cyanosis was distinct, the stridor was less evident; temperature, 103°; respiration, 76; pulse, 180. The child died two days later. No post-mortem was permitted. This case at the time I regarded as one of some malformation of the larynx.



Upper Entrance of Larynx (normal), Infant three months old (after Thomson).

I did not meet with another case until early in March, 1906, when I saw, with Dr. Grant Stewart, of Montreal, an infant five weeks old described as suffering from choking attacks with stridulous breathing. These had commenced when one week old and had gradually become more prolonged and more severe. Well-marked inspiratory stridor developed on any excitement or irregularity of breathing and persisted for some time. Not infrequently it developed during nursing. With quiet breathing the stridor was scarcely audible and it passed away altogether during sleep. On examination of the child, some retraction of the soft parts was noted at both bases; general nutrition was good; there were no enlarged glands, no indications of adenoids, no rachitic rosary, and no indications of a hypertrophied thymus. The temperature was normal; respirations were slightly quickened. Inspiration was even and regular but accompanied by slight stridor during my examination; expiration was noiseless.

Four weeks afterwards the child was again seen by me and a careful examination made by Dr. Craig, assistant laryngologist to the Montreal General Hospital. He reported marked narrowing of the upper aperture of the larynx owing to approximation of aryepiglottic folds; epiglottis much folded on itself and a view of the vocal cords not obtainable. Prolonged attacks of noisy breathing were still present and on several occasions the child had become distinctly cyanotic, but the periods during which the child breathed quietly were much longer.

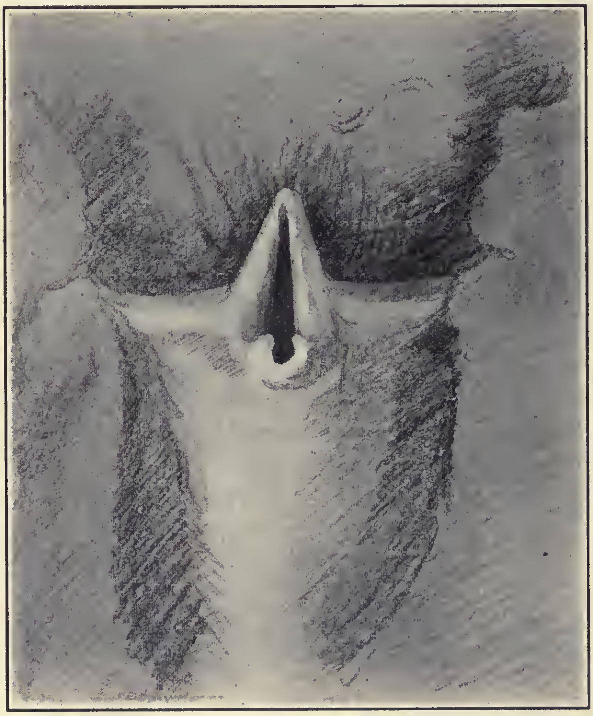
Six weeks after this examination the infant succumbed to a severe erysipelatous infection. No postmortem was obtained.

On October 10, 1907, I was consulted by Mrs. McK., of Shawville, regarding the breathing of her child, a boy two years old. The family history was negative. Its birth had been premature at eight months. No special circumstances attracted attention to its breathing until after the second week, when it was noticed to be unduly noisy and somewhat labored. Shortly afterward the stridor became almost incessant, with exacerbations on excitement. On several occasions the infant became cyanotic and the mother thought it was dead. The child's general nutrition, however, continued good. When a year old the postnasal space was curetted for adenoids by a specialist in a neighboring town with the hope of relieving the condition.

When seen by me a year later the stridor had considerably improved and now only appeared on excitement. It was absent during sleep. Appetite and digestion were good. The infant was not a mouth-breather, and his mother stated that at no time had he been specially liable to colds. The notes taken at the time read as follows:—

"Child looks bright, is somewhat under weight and undersized, color pale, breathing easy, but the exertion of removing his clothes causes slight stridor. No enlargement of the superficial glands;

chest moderately pigeon-shaped; impaired resonance over manubrium, not extending lower than upper border of second rib. Otherwise resonance normal throughout the chest, but breath sounds loud and somewhat strident. Heart sounds normal. Abdominal organs normal." On the 16th, under anesthesia, Dr. Birkett, of the Royal Victoria Hospital, made a careful examination of the throat and reported as follows: "With the bronchoscope under general anesthesia the epiglottis was seen to be folded upon itself so that its lateral edges were about quarter of an inch from each other. Watching during respiration it was noted that the edges of the epiglottis and the aryteno-epiglottidean folds were drawn inward during inspiration, accentuating the stridor. Upon the introduction of the bronchoscope within the laryngeal cavity, thus preventing the falling inward of the folds, the inspiratory movement became perfectly quiet. The movements of the vocal cords were normal." A recent report from the mother states that the stridor has entirely disappeared and that the child is vigorous and healthy.



Case examined by Dr. Birkett, Congenital Laryngeal Stridor, aged two years.

The following is another example for which I am indebted to Dr. Birkett:—

A. B., male, aged three weeks, was brought to the Royal Victoria Hospital on account of a difficulty which the child had in breathing. The mother stated that she had noted this condition since the day of its birth. The infant was found to be well developed and fairly nourished. Whilst resting quietly both inspiration and expiration were accompanied with a slight stridor, more marked with inspiration and becoming accentuated when the child was in any way excited. Under an anesthetic the larynx was examined by means of the bronchoscope, and a picture similar to that in the previous case was seen; quiet respiration at once followed the introduction of the bronchoscope into the larynx.

Much less severe cases of this affection are not infrequently met with, in which as long as the infant breathes naturally there is no stridor, but with the onset of hurried and deep breathing stridor at once makes its appearance.

The following case, which I saw with Dr. Reilly, of Montreal, to whom I am indebted for the notes, may, I think, be regarded as of this character.

A. F., male child, breast-fed, aged two months. Soon after nursing was established it was noted that during this act the infant's breathing became obstructed and noisy. Distinct inspiratory stridor also occurred during bathing and dressing of the infant and on other occasions of disturbed breathing; cyanosis never developed, nor was the infant's breath ever held. Careful examination of the infant revealed no nasal or pharyngeal obstruction; heart and lungs were normal. After the age of three months these paroxysms decreased in number and severity and now at six months are scarcely noticed. Both parents are said to be nervous and excitable, but no definite neurosis exists in either case.

After a careful review of the literature of this affection, I find the majority of recent observers regard the cause of the stridor as purely mechanical and consider that in this affection we have to deal with an exaggeration of the normal infantile type of larynx; a condition due to defective development in the larynx itself rather than dependent upon any spasmodic or incoördinated respiratory act, although this latter may have some influence.

The stridor, which is persistent for the greater part of the time, appears to be due to the vibration of the aryepiglottic folds, which on sudden and deep inspiration become sufficiently tense to give a high note. The character of the sound, however, is variable, and is dependent upon the condition of the folds themselves, upon the amount of stenosis present, and upon the degree to which the membranes are stretched. The sound has been described as whistling, squeaking, grunting, croaking, crowing and purring. Northrup likens it to the croaking of frogs. Riardon speaks of it as a crowing guttural sound.

It rarely reaches the high stridulous note of true laryngismus, and, except in cases with an associated increase of reflex excitability, a condition not characteristic of the simple affection, we meet with no apnea, no holding of the breath, so characteristic of laryngismus. Cyanosis rarely appears because we seldom get the complete closure of the passage that often occurs in laryngismus. When cyanosis does appear it may be due either to a complete approximation of the folds preventing the entrance of air, which is rare; to an associated spasm of the cords; to a blocking of the narrow passage by a collection of mucus; to an associated narrowing of the trachea by a hypertrophied thymus; or to the presence of atelectasis or bronchopneumonia.

The stridor is to be carefully differentiated from the snoring breathing due to adenoids or other nasal and pharyngeal obstructive conditions, and from the sawing stridor due to compression of the trachea, to which I shall refer later.

In the majority of cases the stridor is noted a few days after birth. Of Sutherland and Lack's 18 cases, 75 per cent. occurred during the first week. Of the total number of cases, including my own, in which a record of the age of onset is given, 64 per cent. occurred during the first week and 28 per cent. during the second week. The delay in appearance may be attributed either to defective observation on the part of the nurse, or to defective inspiratory power on the part of the infant.

In one of my cases a previous child was said to have died at the age of four months from choking attacks similar to the one then experienced by the infant seen. Refslund states that a similar condition was also present in the brother of the infant that died under his care, but Cerf, in his review states he does not know of any other instance where a possible hereditary influence manifested itself. There is no difference as to susceptibility between the sexes.

Thomson does not consider the affection as one of serious import to life. Nevertheless, one-sixth of the cases reported have died from affections of the respiratory system. In all cases, except the very mildest, we find distinct indications of an impediment to the entrance of air, manifesting itself in a defective expansion of the air cells at both bases, a condition predisposing to acute disease and also one seriously retarding normal growth and development.

In all cases with severe suffocative attacks inducing much cyanosis, the possibility of a fatal obstruction must be considered by the physician. It invariably is by the mother. Such cases, it appears to me, should be taken into a hospital, where any sudden emergency could be quickly met, and kept there till the danger lessens with advancing age and development. Medical treatment must consist in all measures which will improve general nutrition.

The question of the influence that an enlarged thymus in infancy can exert on the respiratory act in the production of dyspnea and stridor, has for a long time interested the profession.

The position of this gland in the narrow opening between the manubrium and the vertebral column, a distance in the infant of only 2 cm.; the great variability in its size; its mobility rising and falling with each respiratory act; so that in violent respiration it would appear possible to act as a valve and block the opening through which such important structures pass, led observers as early as the eighteenth century to emphasize its importance.

During the earlier and middle decades of the last century writers, especially in Germany, attributed to an enlarged thymus a very definite influence upon the respiratory act, in their opinion often producing stridor and symptoms of urgent dyspnea. Friedleben, in 1847, emphatically denied this in his oft-quoted dictum "*Es giebt kein asthma thymicum,*" a statement which for some time quieted discussion, but it again came to the fore when during the last two decades of the past century several cases were reported in Germany in which entire relief to both dyspnea and stridor had been obtained by opening the mediastinal space and either raising or resecting the thymus. Nevertheless, pathologists, both in England and America, hesitated to accept a definite compression of the trachea by the thymus as a cause for dyspnea. Adami states that in his experience he has not seen an instance of it; and Ewing, of New York, writing in 1897, says very slight importance can at present be attached to the mechanical irritation or pressure of an enlarged thymus. Howland, in a paper read before the American Pediatric Society in 1907, questions how far the thymus can act the part of a tumor without, at the same time, exerting notable pressure on the large venous trunks arising from the head and upper extremities. Mere weight of the thymus is quite unimportant, for Scheele found it necessary to place as much as one kilogram on an infant's trachea before compression was produced. Compression, therefore, when it occurs must result from the swelling of an organ more or less bound down by adhesions.

That distinct compression is a possibility, however, has been asserted in the past by many able pathologists. A very notable instance was reported in 1898 by Lange in the *Jahrb. für Kinderhk.* in which death resulted from an acute compression and blocking of the trachea by a thymus weighing 22.5 grams; a blocking which was distinctly demonstrated at the autopsy. The clinical symptoms were those of acute suffocation. Still more recently Chevalier Jackson, of Pittsburg, has given us a convincing bronchoscopic demonstration during life of the existence of such a compression in a case reported in 1907.

The profession must, therefore, at last acknowledge the possibility of such an amount of compression taking place as may give rise to stridor and dyspnea.

Such stridor, however, differs markedly in its character from that of congenital stridor. It has been described as of an unmusical sawing character; is present both with expiration and inspiration; is persistent, and is uninfluenced by sleep. Careful observation will also show that the movement of the larynx is much restricted. Intense dyspnea with cyanosis often develops. Like the stridor of the congenital type its intensity is increased by excitement.

In a paper read before the Cassel Convention (*für Naturforscher und Aertze*) in 1903, Hochsinger reported an examination of 58 children, none of whom were older than three months. In 26 of these he states a skiagraph showed enlargement of the thymus and of these 26, 20 were said to suffer from stridulous breathing, attributed by him to tracheal compression. In the discussion which followed many of his statements were questioned, but Siegert, of Strassburg, and Feer, of Basle, both reported cases of stridor, due, in their opinion, to pressure exerted by a thymus.

It was acknowledged by all, however, that not only may we have cases of stridor without any hypertrophy of the thymus, but that we frequently meet with marked hypertrophy of the thymus without noticeable stridor.

An urgent dyspnea, also associated with, and apparently due to, hypertrophy of the thymus, is occasionally met with.

Howland, in the very interesting paper to which I have already referred, states that in his opinion the thymus as part of the condition known as status lymphaticus may give rise to an intense dyspnea with cyanosis and sudden death in infants. In some instances, after a sudden indisposition, the infant develops rapid gasping respiration with much dyspnea; a dyspnea out of all proportion to the physical signs. Cyanosis appears with high temperature, followed by unconsciousness, the prelude to a fatal ending, which occurs a few days after the onset of the indisposition. In another group the course is somewhat more prolonged; dyspnea alternates with intervals of more easy breathing; the pyrexia is low; there are no physical signs in the lungs, but cyanosis makes its appearance, again ushering in the fatal issue. Two cases which occurred in my own practice have a close resemblance to the conditions thus described.

An infant artificially fed under my directions from the age of six weeks was suddenly taken ill in Saranac, January, 1899. Digestion had always been difficult and easily disturbed, and two attacks of an influenzal character had weakened the infant. At the time of my visit the infant was suffering from a marked dyspnea. It was lying on its back with its head thrown back. Temperature, 101.5°F.; respiration, 60-70; pulse, 160. A slight coryza was present with a moderate cough. Careful examination revealed no marked impairment of resonance over either lung, breath sounds were harsh with a few large bronchial râles scattered over both sides; heart sounds were clear and cardiac dullness normal. A distinct impairment in resonance, however, was detected over the upper part of the sternum, extending half a finger's breadth below the second rib and to a finger's breadth beyond the sternum on each side. The dyspnea was not always equally pronounced. Periods occurred during which it was distinctly aggravated and during which some cyanosis developed. Within forty-eight hours of my visit death took place suddenly. A limited postmortem was made. The only important pathological condition found was a thymus weighing 23 grams.

The second instance occurred in a relative, in whom, unfortunately, my findings were unverified by postmortem examination. An infant of nine months, previously quite healthy, was noted to be unusually restless during the night. The following morning he was seen by me. There was slight pyrexia, but no physical signs. That evening the temperature was 104°F. and the breathing was very rapid. He was again carefully examined both by myself and a confrère. The only impaired resonance noted was over the thymic area. The temperature was 105°F.; respiration, 70; pulse, 160. Cyanosis rapidly supervened and the infant died at 2 P.M. on the following day. Repeated examinations failed to make out any definite physical signs either in heart or lungs.

Howland states that dyspnea associated with hypertrophy of the thymus is seldom of such a type as to suggest obstruction. While it lasts it resembles the dyspnea of a pneumonia. Stridor is lacking. The retraction of the soft parts is very moderate. The dyspnea also is not persistent, and appears and disappears, presenting the picture of an intoxication rather than one of actual obstruction.

In a very recent paper Fabre and Thevenot, of Lyons, have collected statistics of cases of enlarged thyroid in the newborn, and state that in some cases pressure ascribed to a thymus has been really exerted by a thyroid.

I have no knowledge of this condition in the infant.

Congenital malformations are an occasional cause of dyspnea with more or less stridor. In 1898 O'Dwyer reported a case and discussed the importance of such a condition as the cause of dyspnea and death in the newborn. Not infrequently such malformation takes the form of a web stretching across and limiting the space between the two cords.

For the following notes of an interesting case I am indebted to Dr. G. T. Ross, laryngologist to the Western Hospital: —

R. B., three years old, was brought by its mother for an inability to phonate; on attempting to cry it at once become cyanosed; this condition had existed from birth. Otherwise it was healthy, and the circulatory system appeared to be normal. Laryngeal examination revealed a web stretched between the true vocal cords and pierced in the centre by an aperture large enough to aerate the lungs during quiet respiration. This aperture, however, was at once closed when the laryngeal muscles were called into action, and profound cyanosis resulted. With removal of the web complete relief was afforded.

STILL'S DISEASE: A REPORT OF TWO CASES.

BY DONALD HINGSTON, M.D., F.R.C.S.ED., M.R.C.S.ENG.,
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In 1896 a paper by George F. Still, of the Great Ormond Street Hospital for Sick Children, was read before the Royal Medical and Chirurgical Society of London. In this paper Still called attention to a hitherto undescribed form of chronic joint disease in children, and based his paper on the study of 22 cases which had come under his notice.

From an analysis of the 22 cases he drew a definite picture of the affection, which he defined as "A chronic progressive enlargement of the joints, associated with general enlargement of the glands, and enlargement of spleen."

The disease begins most frequently between the first and second dentitions, and is more common in girls. It may begin acutely with high fever like inflammatory rheumatism, but, as a rule, the onset is insidious. A slight stiffness of a joint is followed by a firm, fibrous, fusiform enlargement of that joint. At intervals other, perhaps all the joints, become affected.

Stress must be laid on the character of the enlargement. There is a general thickening of the tissues around the joints, no bony irregularity, osteophytic growths or bony grating. Postmortem examination shows inflammatory changes around the joint, thickening of the capsules, sometimes intra-articular adhesions, but no bony or cartilaginous changes. Tenderness and redness of the joints is sometimes present, but there is no tendency to suppuration. Limitation of movement is marked, and severe pain is caused by any attempt at exceeding this limitation. The joints most frequently affected are the knees, wrists and those of the cervical spine, and then, in order of frequency, the ankles, elbows and fingers. The muscles relating to the affected joints show early and marked wasting. Periostitis of the phalanges is frequent, giving the fingers a swelled and tapering form.

The most distinctive point, however, in this affection is the general lymphatic and splenic enlargement. The glands affected are chiefly the supratrochlear and those of the axilla and neck. The glands are separate, not tender, and show no tendency to break down. The enlargement is most marked in glands relating to joints most affected. On section they appear normal. The spleen is enlarged, frequently palpable, but appears normal on microscopic examination. The enlargement of both spleen and glands varies with the progress and intensity of the disease. There is often anemia, but no endocarditis or valvular disease. Pericarditis and pleurisy are frequent complications. The children are usually ill-developed.

Two curious symptoms are sometimes noticed. First, a slight prominence of the eyes—too slight to be called exophthalmos, and, secondly, a waxy color of the face with flushed cheeks. The prognosis, according to Still's original paper, was very bad, the affection progressing till a state of permanent general joint disease was reached. Later he has greatly modified this opinion, and he and other observers report complete cures if treatment has been instituted early enough.

The etiology is obscure. Imperfect feeding during infancy, exposure and unsanitary conditions appear to play no part. Taylor and McKim, of Baltimore, look on it as rheumatoid arthritis. Edsall and others suggest tuberculosis. Poynton and Payne searched for microörganisms in and around affected joints, but without success. The opinion generally accepted is that this disease is a definite infection due to some specific microörganism as yet unknown.

Treatment consists in hygienic measures, hot baths, arsenic, massage and forcible movement of the affected joints.

Two cases of this rather rare condition have come under my notice within the last two years.

The first case, L. R., French-Canadian, one of a family of twelve children, was born November, 1903. Family history excellent; no rheumatism or tuberculosis, except in one doubtful case of a maternal aunt, who died of what was possibly phthisis. Six of her brothers and sisters died in infancy, one brother of influenza at the age of five; the other four are in good health.

The child was breast-fed for seven months, passed through normal dentition and escaped all children's diseases. Her surroundings were healthy.

One night in October, 1906, the child being then aged two years and eleven months, she went to bed apparently quite well, but was awakened by pain in the left knee. This pain lasted through the night. The knee was flexed, tender, red and slightly swollen. Next morning the redness and swelling remained, but there was no pain or limping and the child played about as usual. The same thing occurred the following five or six nights. Then diphtheria came on, lasted two weeks, and after it had passed, both knees became flexed, fixed and swollen. The condition progressed, swelling of the ankles came on, and the patient was brought to the Hôtel Dieu.

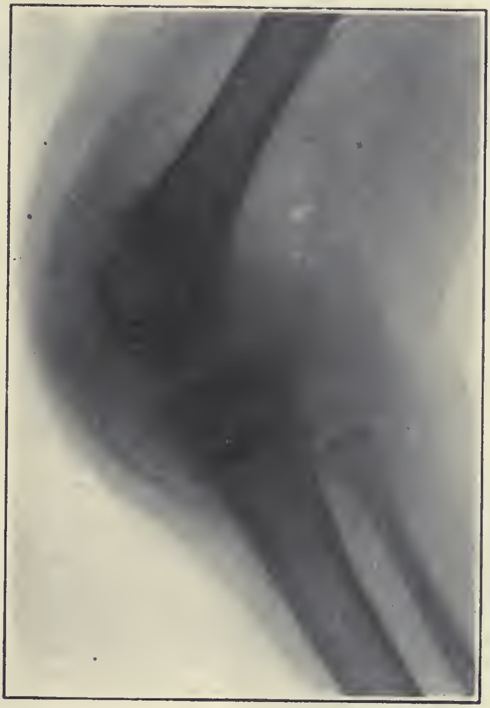

Fig. 1.—Skiagraph of Knee. Case 1.

In appearance she was a healthy, well-nourished child, slightly pigeon-chested. Both knees were fixed in a flexed position, and any attempt at straightening caused great pain. The enlargement was firm, regular and not tender on pressure. There were no evidences of bony enlargement or of fluid in the joints. There was slightly raised temperature, no cardiac, pulmonary or urinary symptoms. The child remained in the hospital for five days, during which time straightening by means of weights was unsuccessfully attempted. At the end of this time, under an anesthetic, the flexion was forcibly corrected and plaster casts applied. The patient returned to her home, St. Sauveur des Monts, in the Laurentians.

The disease progressed, however. She grew restless and feverish. A week after she returned home the mother noticed that the child's elbows were stiff, and that there was swelling of the wrists, hands and fingers.

In October, 1907, the child was brought back to the hospital.

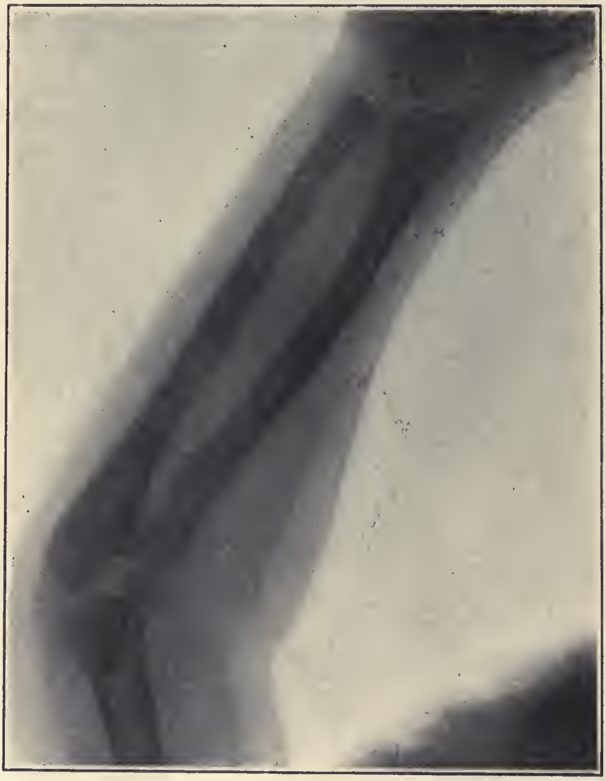

Fig. 2—Skiagraph of Elbow. Case 1.

On examination it was found that both knees and the right elbow were flexed and almost rigid. There was limitation of movement in the left elbow, both wrists and ankles. Attempts at movement caused great pain. The shoulder and hip joints appeared freely movable. The wrists and ankles were enlarged, and the fingers showed a smooth, tapering, painless swelling.

Skiagraphs showed thickening and infiltration, especially of the tissues around the joints, but no bony or cartilaginous lesions.

The supratrochlear, inguinal and cervical glands were enlarged, fairly hard, separate and painless. The spleen was enlarged but not palpable.

The case was diagnosed as one of "Still's Disease," and the child returned to her home to undergo a treatment of fresh air, arsenic, massage and passive movements of the affected joints. The mother wrote me a few weeks ago that there was slight improvement.

The second case, M. L., French-Canadian, shows a most perfect picture of this disease.

Born in January, 1903, the patient, with the exception of a mild attack of laryngitis, always enjoyed excellent health. Five sisters and two brothers are quite well and strong. On her father's side there is a history of tuberculosis and rheumatism. In the summer of 1905 the patient, being then two and one-half years of age, complained of pain in the right knee. This pain came at intervals. In the autumn the attacks became more frequent and more severe. The knee became swollen and flexed, gradually swelling appeared in the other knee, ankles, wrists and

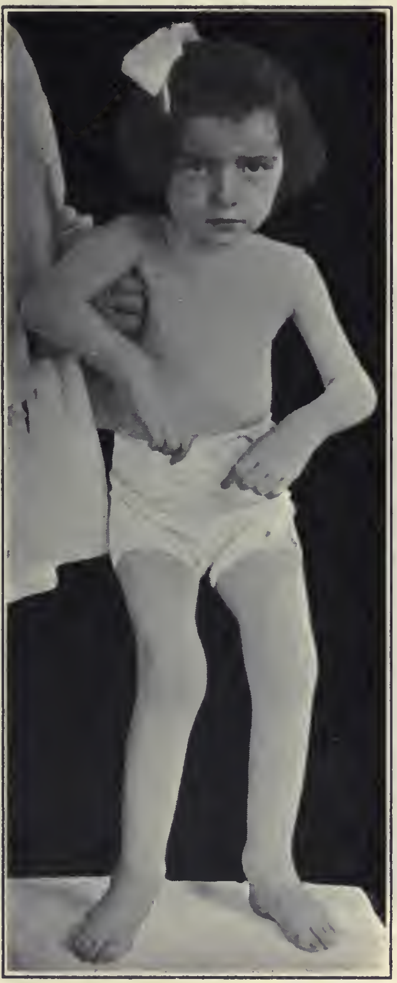

FIG. 3.

Figs. 3, 4 and 5, M. L., aged five years, show, first, the numerous affected joints; second, the slight prominence of the eyes; third, the peculiar tapering swelling of the fingers.

hands. In April, 1906, plaster casts were applied to her legs and the child showed some improvement. In September the stiffness in the legs became more marked, and the child had difficulty in moving her arms. This condition grew worse and in the following spring, 1907, stiffness of the neck appeared. The disease progressed irregularly till December last, when, thanks to the kindness of Dr. Cleroux, I first saw her.

At that time there was almost complete rigidity of elbows, wrists, fingers, knees, ankles and toes. In the shoulder and hip joints movement was limited. The articulations of the cervical spine were much affected, the patient's head being immovably fixed in the flexed position.

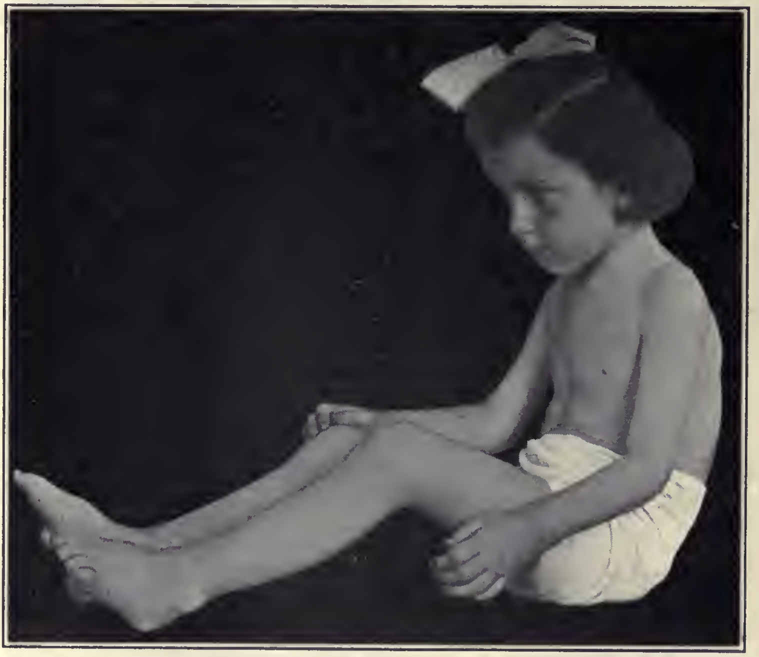

FIG. 4.

The temporomaxiliary joint allowed very little movement, the child not being able to separate her teeth more than 2 cm. Owing to the number of joints involved the child remained motionless, being unable even to turn in bed. There was wasting of muscles of arms and legs, but her general nutrition was excellent. Her face showed the combination mentioned by Still of pallor and flushed cheeks. There was slight prominence of the eyes, the spleen was enlarged, extending to the costal margin. Supratrochlear, axillary, cervical and inguinal glands were enlarged, hard and painless. The fingers and toes showed fusiform painless swelling. Attempt at movement of the affected joints caused severe pain. No fever or urinary symptoms.

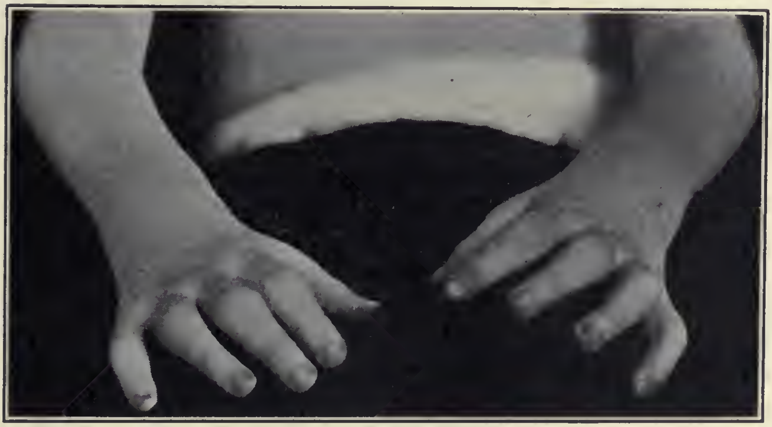

FIG. 5.

A treatment of arsenic, massage and warm baths was tried with immediate results. Movement of the head returned; soon the child began to walk with the aid of leather supports for her legs. The swelling of the arms, hands, fingers and ankles diminished, and her general state improved.

At the present time she can move her head freely; there is slight stiffness of the jaws, left elbow, right shoulder and wrist, and both hip joints and ankles. The stiffness is still marked in both knees, right elbow, left shoulder and wrist.

The right supratrochlear gland and those of the neck are still enlarged. The spleen has become smaller. The patient now seems well on the road to recovery.*

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* LATER.—I have received recent information of these 2 cases. The first was given constant and regular care and is now apparently quite well, all stiffness of the joints having disappeared. The second shows a little improvement only. The treatment was not carried out regularly and relapses were frequent. These relapses corresponded fairly well to the periods when treatment, especially the arsenic, was discontinued.

DIAGNOSTIC VALUE OF LUMBAR PUNCTURE IN ACUTE TUBERCULOUS MENINGITIS OF CHILDREN.*

BY FREDERIC E. SONDERN, M.D.,

Professor of Clinical Pathology, New York Post-Graduate Medical School;
Director of the Clinical Laboratory, New York Lying-in Hospital.

Accurate methods of examination of the cerebrospinal fluid are doubtless of very material benefit in diagnosis and differential diagnosis. While the bacteriological examination has rendered the most brilliant results in positive diagnostic data, and perfected technic has further advanced the efficiency of this single analytical procedure, there is still an uncomfortably large number of cases of tuberculous meningitis in which the bacilli cannot be found. In view of the great similarity in the symptomatology of meningeal lesions it is essential that all possible information should be gained from the cerebrospinal fluid. The bacteriology and the cytology certainly present the most valuable information, but as the laboratory examination of the cerebrospinal fluid is still in a state of evolution and many polemic points exist, it is necessary to make the procedure as complete as possible. The pressure, appearance, density, amount of albumin and other chemical data, the amount of sediment, the tendency to coagulation, the toxicity, the freezing point, and the transmission of some administered drugs to the cerebrospinal fluid may be determined. As yet the additional information thus obtained cannot be considered very satisfactory though at times of value as corroborative evidence. Current literature presents many conflicting views, some far too enthusiastic and others in which evident lack of precision is the reason why the procedure is condemned as a diagnostic measure. As in other clinical laboratory work the obtained information often establishes a diagnosis, but failing this, it invariably furnishes data which are of use in tentative diagnosis and particularly in diagnosis by exclusion.

The finding of tubercle bacilli in the cerebrospinal fluid is the greatest aid the laboratory can render in the diagnosis of tuberculous meningitis, but in their absence it is essential to obtain as much corroborative evidence as possible, and particularly to obtain facts that will exclude lesions which are in question in the differential diagnosis. It is to a brief consideration of the technic and results obtained from these analytical procedures that I invite your attention.

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* Read before the International Congress on Tuberculosis, Section on Pediatrics, Washington, September, 1908.

Experience teaches that the common fault the clinician is apt to make in this as well as other laboratory investigations, is the attempt solely to corroborate the clinical opinion, and failing in this to abandon the examination. No matter how conclusive the clinical picture, if the laboratory examination of the specimen is to be made at all, it should include at least all valuable points; if the actual diagnostic factor is not found, some corroborative evidence is certainly present. On the other hand, indications of lesions may be found which may overthrow the tentative clinical diagnosis.

Bacteriological Examination.—Opinions concerning the frequency with which tubercle bacilli are found in the cerebrospinal fluid in cases of tuberculous meningitis vary within considerable range though most of the recent reports are decidedly more favorable than the older ones. Heubner claimed that bacilli are present only in exceptional cases, and in a recent article of Gindes* he states that they are difficult to find early in the disease when this information is of the most use. On the other hand, Lichtheim and also Breuer† succeeded in finding bacilli in all cases examined. Most observers class their results between these extremes. Friedjung‡ states that they are difficult to find early and frequently present later in the disease; Pfaundler§ finds them in 33 per cent. of cases early and 75 per cent. of all cases. An average figured from the results quoted in six other publications is 69.5 per cent. of all cases. Koplik¶ calls attention to the important point that painstaking search is an essential feature of success. In his earlier work bacilli were found in 64 per cent. of the cases, while during the last few years the figure is 89 per cent., and they were demonstrated on inoculation in all the remaining cases of the latter group. My personal experience is limited to 29 specimens from 27 cases in private practice, where the subsequent course of the disease, and autopsy in 4 cases, justified the clinical diagnosis of tuberculous meningitis. In 22 the bacilli were found on first examination. In two others the bacilli were found on second examination. The percentage of positive results is thus 88 per cent., or practically what Koplik made it in his later series.

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* E. J. Gindes, Arch. f. Kinderheilkunde, 1907.
† Breuer, Wiener kl. Rundschau, 1901.
‡ Friedjung, Wiener kl. Wochensch., 1901.
§ Pfaundler, Beiträge z. klin. Med. and Chir., 1899.
¶ Koplik, Journal of American Medical Association, June 21, 1907.

Concerning the technic, the suggestion made by numerous observers that it is best to spread the coagulum for purposes of staining is certainly better than using the centrifuged sediment and not the coagulum. My experience is, however, that the best results are obtained from a centrifuged sediment before coagulation occurs, or if a clot has formed the practice of inoscopy, as recommended by Jousset* or Zebrowski.† The specimens, however prepared, should be stained and decolorized in the usual manner, but not counterstained. The absence of a counterstain is particularly desirable when a prolonged search has to be made. All specimens should also be searched for other organisms, even if tubercle bacilli are present, as a mixed infection is not only of importance in a consideration of the case, but may explain why the cytology of the cerebrospinal fluid and the result of a blood examination do not correspond to what is usually found in tuberculous meningitis.

The inoculation test is considered positive in every instance by those who have used it to any extent, its sole objection being the time it requires to learn the result. In all but exceptional cases this element makes it useless and a quicker and just as accurate result is obtained by the direct search for bacilli repeated as often as necessary. While bacilli may not be found in the first or second specimen, it is reasonable to believe that subsequent examinations will reveal them long before the positive outcome of an inoculation test becomes apparent.

In this connection the recent article by Much‡ may be of interest. He asserts that there are forms of tubercle bacilli which are not acid proof and consequently do not stain by the usual methods employed. If these observations are correct they may explain why tubercle bacilli are sometimes not found in obviously tubercular lesions, and also the difficulties encountered in the demonstration of these organisms in the cerebrospinal fluid.

Cytology.—The morphological study of the leukocytes in the cerebrospinal fluid has resulted in some rather definite diagnostic data. This is by no means as conclusive in any instance as finding the causative organism, but it is always helpful and stimulates the search in one or other particular direction for bacteria as well as conclusive clinical signs. The essential facts are the relative prevalence of lymphocytes or of polynuclear cells, but one must not fall into the error of believing, as is so often stated, that lymphocytes indicate tuberculosis and polynuclear cells an acute pyogenic process, for there have been too many exceptions found to this crude rule. The significance of a relative lymphocyte increase or of a polynuclear cell increase depends on a number of factors, the careful consideration of which determines the value of the cyto count in the given case. The results are most accurate in fully developed acute cases of meningitis, less so in the very early stages, and still less so in the later stages, or in convalescence, as the case may be. In the fully developed acute stage of meningitis an excess of lymphocytes tends to indicate a tuberculous process, while an increase in the relative number of polynuclear cells would rather speak for a meningitis due to streptococci, staphylococci, pneumococci, or meningococci, the differential diagnosis depending on the bacteria found. While a relative lymphocyte increase under the circumstances cited is suggestive of tuberculosis, in the absence of tubercle bacilli the following exceptions must be kept in mind. Typhoid fever with meningeal symptoms and without a mixed infection will show a relative lymphocyte increase usually without bacteria, as long as the symptoms last. Meningism accompanying pneumonia, mumps and numerous other diseases in children, if there is an increase of leukocytes in the cerebrospinal fluid, will at first also show an excess of lymphocytes and no organisms; if this condition develops into a true meningitis, the polynuclear cells then show relative increase and the etiological bacteria are found. It seems more difficult to explain why a relative polynuclear increase should sometimes occur in tuberculous meningitis. I have met with this exception in one case only, and was able to demonstrate a mixed infection of tubercle bacilli and pneumococci. It is, however, described in a relatively small number of cases by most observers, and constitutes the chief reason why the value of cytology has been discredited, as for example by Mutzner. A mixed infection would seem the most plausible way to explain this anomaly; and this is also the belief of Ross,* who has found evidences of it in a number of cases, and Frank Eve, of Hull, who obtained staphylococci in cultures from these cases of tuberculous meningitis, verifying the diagnosis at autopsy.

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* Jousset, La semaine med., 1903.

† Zebrowski, Deut. med. Woch., 1905.

‡ Much, Beiträge z. Klinik. d. Tuberculose.

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* Ross, British Medical Journal, September 21, 1907, p. 742.

It seems unfortunate that in a large number of publications in reference to cytology as a diagnostic factor there are comparatively few citations of the actual figures obtained. My series of 15 counts in tuberculous meningitis shows the following:—

	Lymphocytes.	Polynuclear Cells.
1	88 per cent.	12 per cent.
2	75 "	25 "
3	96 "	4 "
4	90 "	10 "
5	82 "	18 "
6	77 "	23 "
7	97 "	3 "
8	82 "	18 "
9	96 "	4 "
10	28 "	72 "
11	80 "	20 "
12	68 "	32 "
13	97 "	3 "
14	90 "	10 "
15	88 "	12 "

Excluding the No. 10 count which was the cited case in which evidences of a mixed infection were found, the average lymphocyte percentage was 86. Koplik* details the results obtained in 19 specimens; in 17 of these the realtive percentage of lymphocytes was over 70. The degree of increase of the one or other variety of leukocyte should always be noted, as I believe further experience will attach importance thereto. For example, in my case of mixed infection quoted, the polynuclear percentage was 72 per cent., which is considerably lower than what we usually find in nontuberculous meningitis of one or other type. Obviously a large amount of additional data will be necessary before conclusions on this point are justified.

A consideration of cytological changes at times other than in the fully developed acute stage of a meningitis would take us too far afield and unfortunately to little or no purpose.

Concerning the technic, slides and not cover glasses should be thinly spread with the sediment and stained with one of the polychrome blood stains which should be diluted. I prefer a mixture of Jenner and Wright on account of obtaining the more distinct nuclear stain of the former and clear neutrophilic granulations of the latter.

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* Koplik, l. c.

Pressure of the Cerebrospinal Fluid. Several simple and ingenious methods have been devised for the determination of the pressure, and a number of observations have been published, for example those of Quincke,* Sicard and Krönig.† It is generally believed, however, that those practising lumbar puncture soon learn to form an opinion as to the approximate degree of pressure which is generally increased in direct ratio to the extent of exudation. The clinically important point is that increased pressure is significant, but the accuracy obtained by the use of a manometer is not necessary, particularly as the pressure in the tapping instrument is often no guide to the pressure above on account of frequent obstructions. Tschernoff is quoted by Gindes as saying, that a serous meningitis remains a serous meningitis be the pressure 15 mm. or 120 mm. and this seems a sensible argument. For practical purposes then, the pressure noted on puncture is a guide to the amount of accumulated exudate provided no obstruction to the flow exists.

Appearance. In typical cases of tuberculous meningitis the fluid is perfectly transparent and has no color. There has been no exception to this rule in my experience except in the case of mixed infection, but Friedjung‡ claims to have observed considerable turbidity and G. C. Robinson§ also speaks of slight opalescence and slight turbidity. In meningitis due to the meningococcus, and the pneumococcus the fluid is usually turbid and in the presence of pyogenic organisms it is often distinctly purulent.

Density and Molecular Concentration. The specific gravity which is normally about 1.006 is increased in meningitis according to the increase in the amount of albumin as in other serous exudates. The same applies to the degree of molecular concentration as determined by cryoscopy. Both of these procedures are of value in the differential diagnosis of afebrile chronic brain lesions, but are quite secondary in the condition under consideration.

Chemistry. The amount of albumin is increased in all acute inflammatory meningeal lesions and in tuberculous meningitis, offering but little if any aid in their differential diagnosis. It is for example low in some cases of chronic hydrocephalus, slowly developing brain tumors and some cases of serous meningitis and high in other cases of hydrocephalus and in the acute conditions mentioned. In the 15 specimens from cases of tuberculous meningitis the maximum found was approximately two parts per mille by weight and the minimum approximately three-quarters per mille by weight. Other observers report both higher and lower figures. Other chemical problems such as the amount of urea, the presence of sugar and the presence of cholin are engaging the attention of the scientist, but are as yet of no established practical value, particularly in the condition which now has our attention.

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* Quincke, Berliner kl. Woch., 1891.

† Krönig, Berliner kl. Woch., 1897.

‡ Friedjung, l. c.

§ Robinson, Bull. Ayer Clin. Laboratory No. 4.

Sediment. The amount of sediment in tuberculous meningitis is usually quite slight. This feature serves as a differential point to some extent and has led to efforts to scientifically determine the number of cells in a given amount of fluid by much the same method as is used in the examination of the blood. Fuchs and Rosenthal have constructed a special chamber for this purpose and Purves Stewart published his results therewith. In general it may be said, that the experienced laboratory worker can easily determine if there is an increase in cells present and approximately to what degree. The additional refinement serves about as little practical purpose as the determination of pressure by means of a manometer previously mentioned.

The cytology of the sediment has been considered. It is doubtless the most important feature of the examination aside from the bacteriology.

The occurrence of spontaneous coagulation in the specimen was formerly considered an absolute indication of an inflammatory exudate and relied on by many as a distinct diagnostic feature in meningitis. This opinion though still held by many has been disturbed by the publication of cases of brain tumor and consequent stasis in which distinct coagulation occurred in the cerebrospinal fluid. In tuberculous meningitis the coagulum is usually very frail and spider-web like, whereas in acute meningitis of other type the clot is apt to be large and firm.

Toxicity. French and Italian observers have devoted considerable attention to the toxicity of the cerebrospinal fluid, but as yet no practical results of use in diagnosis have been attained.

Transmission of Administered Drugs. An interesting statement is made that Griffon and Sicard found they could recover iodine in the cerebrospinal fluid after the administration of potassium iodide in normal persons and in cases of purulent meningitis, whereas there was no such transmission in cases of tuberculous meningitis. Lehri is said to deny this emphatically, and von Jaksch claims that no iodine can be demonstrated under any circumstances, but the subject is attractive and certainly worthy of experiment.

In conclusion, the chief diagnostic and differential features are tabulated:—

Tuberculous Meningitis.

Pressure. Increased.

Appearance. Usually transparent and colorless, occasionally slight opalescence.

Density. Not much increased.

Albumin. From three-quarters to two per mille by weight.

Coagulation. Slight and frail.

Sediment. Slight.

Cytology. Average number of lymphocytes 86 per cent.

Bacteriology. Tubercle bacilli found in about 88 per cent.

In the presence of tubercle bacilli, a relative polynuclear cell increase should stimulate the search for organisms of a second or mixed infection, particularly if the sediment is more abundant and coagulation pronounced.

In the absence of tubercle bacilli and other organisms, if relative lymphocyte increase and the other suspicious signs exist in an acute febrile case, the repeated search for bacilli is indicated and the other causes for this combination should be kept in mind, namely, meningism of typhoid, pneumonia and infectious diseases.

Abundant sediment, relatively high polynculear cell count, firm coagulation, decidedly increased density and large amount of albumin indicate a purulent meningitis and the causative organism, pneumococcus, streptococcus or staphylococcus, is invariably found. The differential diagnosis between this class and tuberculous meningitis never offers difficulty.

Cerebrospinal meningitis due to the intracellular diplococcus sometimes presents specimens which closely resemble those from a tuberculous meningitis. The differentiating points are, that the relative polynuclear cell increase is high, usually over 85 per cent., even if the number of cells present is small, and that the characteristic organisms are invariably found according to most authors and were present in 96 per cent. of the cases of my series.

THE RELATIVE FREQUENCY OF ABDOMINAL TUBERCULOSIS IN CHILDREN IN GREAT BRITAIN AND THE UNITED STATES.*

BY DAVID BOVAIRD, JR., M.D.,
New York.

In 1901 in the course of an investigation regarding the frequency of primary intestinal tuberculosis in children, the fact was developed that there was a remarkable discrepancy between the data derived from the hospitals of Great Britain and those of New York. Thus the British statistics gave 18 per cent. of primary intestinal infections against 1 per cent. for New York. The difference was certainly striking. It seemed hardly possible that there could be so great a discrepancy, and there was a natural tendency to seek the explanation of it in differences in the methods of examination rather than to accept the figures as true. During the last few years observations have been made which show that there is an equal discrepancy in the data regarding the frequency of abdominal tuberculosis as determined by clinical observations in these two countries. And as it will, I believe, be granted that where primary intestinal tuberculosis is frequent there abdominal tuberculosis (that is, tuberculosis of the intestines, mesenteric, lymph nodes and peritoneum) ought to be frequently met with, or conversely abdominal tuberculosis should be rare when primary intestinal infections are uncommon, it has seemed that the subject is of some importance. If it can be shown that abdominal tuberculosis is many times more frequent in Great Britain than in the United States, we shall have corroborative evidence of the remarkable data regarding the frequency of primary intestinal tuberculosis and shall be therefore more ready to accept them as correct. And if correct these data present a problem of some importance in the study of tuberculosis in children, the solution of which must have important bearings on the question of the prevention of tuberculosis in the young.

The writer's interest in the matter of the relative frequency of abdominal tuberculosis was aroused by a visit to the Royal Hospital for Sick Children, Edinburgh, in 1904. Under the guidance of Dr. John Thomson he was there shown in a single morning more cases of unquestionable abdominal tuberculosis in children than had come under his observation in ten years' work in the dispensaries and hospitals of New York City. Dr. Thomson was impressed by this fact, and in the *British Journal of Tuberculosis,* July, 1907, published a paper on the subject, giving data from the hospitals of Edinburgh, Glasgow and London, and contrasting them with such American statistics as he could obtain. I desire merely to present Dr. Thomson's data regarding the hospitals of Great Britain and to compare them with the returns from American hospitals not accessible to him.

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* Read before Section IV., International Congress on Tuberculosis, Washington, D. C., September, 1908.

You will observe that in these data are given the total number of children treated yearly in each institution, the number of cases of abdominal tuberculosis and of tuberculous meningitis. The latter figures (for tuberculous meningitis) are used as an index of the relative frequency of tuberculosis in all forms. As is well known the meningeal disease may be the terminal event in any form of tuberculosis and its incidence will probably reflect quite accurately the frequency of tuberculosis in any community. Comparison of the ratios of abdominal tuberculosis and tuberculous meningitis will therefore show us where the abdominal type of disease prevails and to what extent.

The most striking feature of these tables is the constancy of the ratios for both types of tuberculosis in each of the hospitals represented. Attention may also be called to the fact that there is three times as much abdominal tuberculosis in Glasgow as in London, if the hospitals quoted may be regarded as typical of conditions prevailing in their respective communities.

If now we strike an average for the three cities we find that these tables give 9.75 cases of abdominal tuberculosis to 4.89 cases of meningeal tuberculosis or practically 2 to 1, as representing the conditions prevailing in Great Britain.

TABLE I.

CHART SHOWING PERCENTAGES OF ABDOMINAL TUBERCULOSIS AND TUBERCULOUS MENINGITIS IN THREE GREAT BRITAIN HOSPITALS.

Royal Hospital for Sick Children. Edinburgh.

	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	Average.
Number of patients admitted	1,154	1,219	1,361	1,398	1,533	1,597	1,504	1,596	1,844	2,114	1,532
Percentage of abdominal tuberculosis..	3.63	3.75	2.57	4.36	2.73	3.63	4.98	3.82	3.14	3.20	3.57
Percentage of tuberculous meningitis.	3.29	2.87	2.42	2.21	2.02	1.63	2.12	1.12	1.57	1.27	2.05

Hospital for Sick Children. Great Ormond St., London.

	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	Average.
Number of patients admitted	1,946	2,067	1,962	1,690	2,111	2,236	2,403	2,537	2,876	3,068	2,289
Percentage of abdominal tuberculosis..	0.66	1.11	1.32	1.71	1.46	1.61	2.03	2.24	2.60	1.98	1.67
Percentage of tuberculous meningitis.	1.49	0.72	1.52	1.88	1.27	1.11	1.16	1.65	1.53	1.85	1.42

Royal Hospital for Sick Children. Glasgow.

	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	Average.
Number of patients admitted..........	691	744	741	714	738	854	996	941	1,125	1,075	882
Percentage of abdominal tuberculosis..	4.05	4.30	3.91	3.92	5.28	4.58	4.32	5.19	5.24	4.46	4.51
Percentage of tuberculous meningitis.	1.49	0.72	1.52	1.88	1.27	1.11	1.16	1.65	1.53	1.85	1.42

Table II.

CHART SHOWING PERCENTAGES OF ABDOMINAL TUBERCULOSIS AND TUBERCULAR MENINGITIS IN THREE UNITED STATES HOSPITALS.

Babies' Hospital. New York.

	1900	1901	1902	1903	1904	1905	1906	1907	Average.
Number of patients admitted......	395	475	342	610	946	1,036	1,031	975	728
Percentage of abdominal tuberculosis............................	0.0	0.4	0.0	0.0	0.0	0.1	0.1	0.2	0.1
Percentage of tuberculous meningitis..........	0.8	1.2	0.9	0.8	0.9	1.9	3.0	2.0	1.4

Children's Hospital. Boston.

	1893	1894	1895	1896	1897	1898			Average.
Number of patients admitted......	581	675	758	765	910	927			768
Percentage of abdominal tuberculosis	0.4	0.0	0.4	0.4	0.4	1.0			0.4
Percentage of tuberculous meningitis............................	1.0	0.3	1.0	2.5	1.5	1.4			1.3

Post-Graduate Hospital. New York.

	1899	1900	1902	1903	1904	1905	1906		Average.
Number of patients admitted.....	1,035	979	953	934	1,121	1,111	1,059		1,028
Percentage of abdominal tuberculosis............................	0.5	0.2	0.6	0.2	0.6	0.9	0.6		0.51
Percentage of tuberculous meningitis............................	1.5	0.0	0.5	1.1	0.0	0.4	0.4		0.56

Alongside these figures I place in contrast data from three representative hospitals in the United States. It is at once evident that the figures differ remarkably for the several hospitals and also in the same hospital from year to year. Desiring to eliminate what must be regarded as the play of chance in the tables, I have dropped the classification of returns by years and massed the statistics from all the hospitals available in the following tables:—

TABLE III.

FREQUENCY OF ABDOMINAL TUBERCULOSIS IN GREAT BRITAIN.

HOSPITAL.	Total Number Treated.	Abdominal Tuberculosis.	Tuberculous Meningitis.
Great Ormond Street	22,890	382	329
Edinburgh Children's	15,320	547	314
Glasgow Children's	8,820	398	126
Totals	47,030	1,327	769

Percentage of abdominal tuberculosis equals 3.
Percentage of tuberculous meningitis equals 1.6.
Abdominal tuberculosis: tuberculous meningitis: : 2 :1.

TABLE IV.

FREQUENCY OF ABDOMINAL TUBERCULOSIS IN THE UNITED STATES.

HOSPITAL.	Years.	Total Number Treated.	Abdominal Tuberculosis.	Tuberculous Meningitis.
Post-Graduate	7	7,222	36	39
Babies', 1888-1901	13	4,554	4	31
Babies', 1902-1907	5	4,944	4	86
New York Infant Asylum, 1894-1900	7	4,098	1	5
Children's, Buffalo, 1892-1900	8	1,151	0	3
Children's, Boston	7	4,616	21	43
Seaside, 1900 1907	7	7,231	5	6
New York Foundling	3	2,875	2	26
Presbyterian	2	610	8	26
Mount Sinai	7	2,266	1	80
Totals		39,567	82	345

Percentage of abdominal tuberculosis equals 0.21.
Percentage of tuberculous meningitis equals 0.9.
Abdominal tuberculosis: tuberculous meningitis: : 0.21: 0.9 or : : 1 :4.

There has been no selection of data. The figures for every hospital whose returns were accessible are here given. The contrasts in several instances are remarkable, but I shall not turn aside to consider them. The figures make it clear that, on the whole, tuberculosis is much less frequent among children in the United States than in Great Britain. They also show that we have, on the average, 4 cases of meningeal tuberculosis for 1 of abdominal tuberculosis. Comparing this result with that already obtained for Great Britain we may safely say, with regard to the frequency of the abdominal localization in cases clinically tuberculous, we find that such localization is eight times more frequent in Great Britain than in the United States. Or, comparing the figures for the hospitals individually, Great Ormond Street shows four times more abdominal tuberculosis than the United States, the Edinburgh Children's Hospital about eight times, and the Glasgow Children's Hospital about twelve times.

If, however, we take the frequency of the two types of tuberculosis in the total of sick children treated, we see that on the average abdominal tuberculosis is fifteen times as frequent in Great Britain as in these parts, the figures being 3.25 per cent. of the total treated in Great Britain and 0.22 per cent. in the United States.

These figures surely demonstrate beyond doubt that abdominal tuberculosis is many times more frequent among children in Great Britain than in the United States.

As was said at the beginning of the paper this fact is of great importance when taken in juxtaposition with the data derived from postmortem examinations as to the frequency of primary intestinal tuberculosis.

From British sources we may take the figures shown in Table V., a total of 1,161 examinations showing primary intestinal tuberculosis in 236 = 20 per cent.

We may add that some writers (Sydney Smith) claim that these figures are low and that 30 per cent. of all cases of tuberculosis in children in Great Britain show a primary intestinal lesion.

TABLE V.

FREQUENCY OF PRIMARY INTESTINAL TUBERCULOSIS AS DETERMINED BY POSTMORTEM EXAMINATIONS IN

GREAT BRITAIN.	Total Number of Examinations.	Cases of Definite Primary Intestinal Tuberculosis.
Carr	120	20
Woodhead	127	14
Guthrie	77	19
Still	269	63
Ashby	155	20
Shennan	413	100
Totals	1,161	236 =20 %

UNITED STATES.	Total Number of Examinations.	Cases of Definite Primary Intestinal Tuberculosis.
Northrup	125	3
Holt	119	0
Bovaird	125	2
Hand	115	10
Foundling Hospital (unpublished)	136	6
Totals	620	21 = 3.5%

From American sources we have the data also shown in Table V., a total of 620 examinations, showing 3.5 per cent. primary intestinal tuberculosis.

Here we have the same contrast that we found in the clinical data and it seems to me that taken together these figures confirm one another and establish, as thoroughly as need be, that intestinal infection in the tuberculosis of children is many times more frequent in Great Britain than it is here.

It may also be said that it is probable that a careful investigation would reveal a like contrast between Great Britain, Germany and France, for the data which I was able to gather six years ago indicated clearly a general harmony between the findings of German and French observers and our own, the data from Great Britain being at variance with all the others. It is in this difference in the fundamental facts regarding tuberculosis in children that I believe the explanation can be found of the apparently irreconcilable views as to the frequency of bovine infections held by the writers of different nationalities, for whatever views may be held as to the interpretation of the localization of the lesions with relation to the question of path of infection, there is general agreement that if infection takes place from milk it will most probably show itself in tuberculous lesions of the intestines, mesenteric nodes, and possibly peritoneum—abdominal tuberculosis in other words. This fact has been amply proven, for all the recent investigations of the type of tubercle bacilli to be found in human lesions show that the bovine type is frequently (70 per cent.) found in cases of abdominal tuberculosis in children and rarely in other cases. (Hess, *American Journal of Medical Sciences,* August, 1908.)

It is, of course, true that the investigations of cases for types of bacilli have not been numerous enough to be decisive, but going only so far as the evidence available justifies, we may say that where abdominal tuberculosis is common, there bovine infection will be found frequent, and not under other conditions. The application of this proposition to the data I have given is obvious.

THE BACTERIAL CONTENT OF WHEY.

BY OSCAR M. SCHLOSS, M.D.,

New York.

From the fact that in the process of making whey the paracasein entangles a large portion of the fat globules within its meshes, it occurred to me that it would be interesting to determine to what extent the bacteria share in the fate of the fat by determining the relative bacterial content of whey and the milk from which it had been made.

The difference in the number of bacteria in whey and the corresponding milk would indicate the number of bacteria removed with the clot if the whey was not contaminated during the process. In making whey there are many opportunities for contamination and owing to the heat employed the conditions are rendered favorable for the growth of the bacteria already present. An additional chance for variation is in breaking up the clot, for obviously, the more completely the clot is disintegrated, the more opportunity there will be for entangled bacteria to be liberated.

For this work two sets of experiments were made. In one the whey was produced as it would be for infant feeding by any mother or nurse of ordinary intelligence. The process was made as short as possible and the utensils used were scalded with hot water. In making the whey the usual amount of rennin, in powder or solution, was added and the milk allowed to stand at a temperature of 30-40° C. until a clot formed. The clot was broken up well and the whole strained through clean muslin. For obvious reasons the whey was not heated to destroy the ferment. In the second set of experiments every possible precaution was taken to limit contamination. The whey was made in sterile test tubes, the clot was not disturbed and the whey which was squeezed from the intact clot was used to make the counts.

In order to determine if the growth of the bacteria in the plates from the whey was inhibited by preservatives in the rennin preparations, the following tests were made: To each of two test tubes containing equal amounts of nutrient broth 0.1 c.c. of a

1-50 milk dilution was added, one of the tubes containing the same percentage of the preparation of rennin to be tested as had been used to make the whey. The tubes were kept at 22°C. for about sixteen hours and plated in dilutions of 1-1,000 and 1-10,000. In no instance did the tube containing the rennin preparation show a count sufficiently less than the control to prove, or even suggest, any germicidal action.

As a routine measure dilutions of 1-500 and 1-1,000 were made. The plates were incubated at 22°C. (room temperature) and were counted at the end of three and six days. The corresponding plates of milk and whey were kept close together so as to be subjected to exactly the same conditions.

EXPERIMENTS.

No. I.

Milk allowed to clot in clean vessels, clot well broken up and strained through clean muslin.

Pepsin Rennin Solution.

	I.	II.	III.	IV.
Milk	546,000	3,500,000	1,220,000	2,100,000
Whey	89,000	700,000	216,000	400,000
Percentage of bacteria removed ..	83%	80%	82%	81%

Rennin Solution.

	I.	II.	III.	IV.
Milk	2,940,000	4,270,000	4,494,000	1,900,000
Whey	524,000	700,000	801,000	450,000
Percentage of bacteria removed ..	82%	83%	82%	76%

Rennin Solution.

	I.	II.	III.	IV.
Milk	20,000	2,520,000	35,000	28,500
Whey	3,500	850,000	8,500	18,500
Percentage of bacteria removed ..	82%	66%	75%	35%

Rennin Tablets.

	I.	II.	III.	IV.
Milk	721,000	100,000	5,550,000	756,000
Whey	160,000	18,000	1,100,000	170,000
Percentage of bacteria removed . .	77%	82%	80%	78%

EXPERIMENTS.

No. II.

Milk allowed to clot in sterile test tubes. The whey expressed from the intact clot was used for the counts.

Pepsin Rennin Solution.

	I.	II.	III.	IV.
Milk	2,646,000	89,000	497,000	100,000
Whey	196,000	6,000	58,000	18,000
Percentage of bacteria removed . .	92%	93%	88%	82%

Rennin Solution.

	I.	II.	III.	IV.
Milk	1,220,000	500,000	300,000	6,340,000
Whey	140,000	52,000	14,000	400,000
Percentage of bacteria removed . .	88%	89%	95%	93%

Rennin Tablets.

	I.	II.	III.	IV.
Milk	950,000	630,000	546,000	2,100,000
Whey	125,000	50,000	38,000	305,000
Percentage of bacteria removed . .	86%	92%	91%	85%

The figures given represent the number of bacteria in 1 c.cm.

These experiments show that in the rennin coagulation of milk many of the bacteria are included in the clot and the whey contains far fewer bacteria than the corresponding milk.

These experiments were carried out at the Research Laboratory of the Board of Health, and I desire to express thanks for many courtesies.

SLEEP SWEATS IN CHRONIC PHARYNGEAL STENOSIS.

J. R. CLEMENS, M.D.,
St. Louis, Mo.

To the already long list of symptoms and physical signs of adenoids and tonsillar hypertrophy I venture to add sleep sweats.

The characters of these sweats are that they are excessive and generalized (hyperidrotic), and are directly dependent on sleep for their evocation. Further, they are independent of posture in sleep (prone or upright); of the time (day or night), of the season of the year, or of the amount of covering. As soon as the child is in deep sleep the examining hand meets everywhere over the body evidences of hyperactivity of the sudorsal reflexes. In the waking hours of such a child no anomaly of the sweat secretion is present.

The middle period of childhood is the time at which this paradoxical hyperidrosis is met with when the epidrosis of early rickets need not be considered, nor indeed is rickets a necessary antecedent. It is at this period of childhood that lymphatic hyperplasias of the pharynx are most pronounced. The excessive sweating in the defenseless stage of sleep exposes the child to the risk of chill and thus a vicious circle is established where cause and effect alternate. Ablation of the hypertrophied tonsils and adenoids perfects an immediate and permanent cure. The condition is therefore analogous to the sweats of phthisis which Lauder Brunton attributes to imperfect respiration. The presence of sweat centres in the spinal cord have been definitely established (Zeppert).

Whether irritation of these centers with increase of the sudoral reflexes by pressure from hyperplasia of Waldayer's lymphatic ring be possible is a question which is, at best, but widely problematical. While sleep sweats such as I have described are not constant phenomena of pharyngeal stenosis, they are met with often enough to deserve a place among occasional signs.

CLINICAL MEMORANDA.

A CASE OF DIABETES IN A BOY TEN YEARS OF AGE.*

BY HENRY HEIMAN, M.D.,
New York.

This patient, ten years old, was admitted to the Children's Department of Mt. Sinai Hospital (service of Dr. Koplik) on October 13, 1908, with the following history:

Family History.—No diabetes or other constitutional diseases in the family.

Previous History.—Had measles when three years old. Has suffered from nocturnal enuresis since infancy. Four years ago the tonsils and adenoids were removed.

Present History.—Began about five months ago with constant feeling of thirst, increased appetite, increased frequency of urination, and loss of weight.

Physical Examination.—General condition good, fairly well nourished, left pupil somewhat larger than right, both react to light and accommodation. Teeth in fair condition. A few small glands are palpable in the inguinal regions. Lungs are negative. The outlines of the heart are normal. At the apex is heard a short systolic murmur. The second pulmonic sound is accentuated. The liver is felt indistinctly at the free border. The spleen is not palpable. The abdomen is negative. The knee-jerks are not obtainable.

Weight 59 pounds, 11 ounces.

Urine, acid. Specific gravity, 1.032. Albumin, very faint trace with picric acid only. Amount in twenty-four hours, 5,700 c.c. Sugar, 5 per cent., 285.0 in twenty-four hours, urea 46.6. Acetone and diacetic acid present. Microscopic examination, few small hyalin, finely granular and coarsely granular casts, few epithelial cells.

During the first week in order to determine the amount of sugar on an ordinary diet the patient was given daily the following articles of food:

Milk	390.0
Oatmeal	360.0
Bread	210.0
Broth	210.0

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* Read before the New York Academy of Medicine, Section on Pediatrics, March 11, 1909.

Rice	180.0
Water	540.0

While on this diet the general condition remained the same, but 3 pounds of weight were lost. The average daily amount of urine was 3,000 c.c. and the sugar varied from 5.5 per cent. to 6.3 per cent.

The subsequent week the patient was put on a more restricted diet, of which the following is a sample:—

Clear soup	150.0
Apples	450.0
Eggs	120.0
Orange	30.0
Cream tomato soup	300.0
Boiled beef	120.0
Spinach	150.0
Pickles	240.0
Lettuce salad	60.0
Stewed apples	90.0
Raspberry vinegar	30.0
Watercress soup	120.0
Spinach soup	150.0
Chicken	60.0
Cabbage	90.0
Jelly	60.0

While on this diet the general condition improved markedly, the mental condition was much brighter. The weight, however, remained stationary. While the twenty-four hour quantity of urine varied from day to day, the percentage and twenty-four hour quantity of sugar decreased steadily during this period.

On October 27th, Dr. Rudisch was requested to take charge of the patient and ordered the following diet:—

Spinach	30.0
In soup	300.0
Eggs	2.0
Almonds	105.0
Pickles	62.0
Lettuce	110.0
Boiled beef	80.0
Sauerkraut	30.0
In soup	130.0

Chicken	68.0
Lemon Gelatin	104.0
Tomato soup	32.0
Asparagus	35.0
Cabbage	36.0
In soup	256.0

This represents:—		Calories.
Proteids	88.65	363.46
Carbohydrates	22.70	93.00
Oils	54.0	470.00
Fats	89.15	829.09
Total caloric value		1,755.55

Atropin methylbromid, grain $^1/_{60}$ *t.i.d.*, was ordered. This was continued in doses of grain $^1/_{60}$ to grain $^1/_{30}$ three to five times a day until November 15, 1908, when atropin sulphate, grain $^1/_{208}$ was substituted, and this was increased gradually up to grain $^1/_{120}$ *t.i.d.* without any toxic effects. In addition to the atropin methylbromid or atropin sulphate, bicarbonate of soda, grain xxx four times a day, and olive oil ½ ounce, with 2 drops of essence of peppermint four times a day, were continuously given.

From November 1, 1908, to January 4, 1909, there was a steady decrease in the daily quantity of sugar, which on the latter date amounted to only 4.2 grams. The patient gained about 3 pounds during this period. On January 5th, the sugar disappeared entirely from the urine. On the 7th of January, the patient had crackers and the effect on the sugar showed as follows:—

January	8th	7.0 grams
"	9th	31.0 "
"	10th	8.0 "
"	11th	2.9 "
"	12th	none
Total		48.9 grams

The sugar remained absent until January 15th, when 60.0 grams were excreted; this was accounted for by his taking one-half cup of cocoa on the 14th. Since February 12th sugar has been constantly absent from the urine. The daily amount of urine has varied from 3,000 to 1,700 c.c. Slight traces of acetone have been present, but no diacetic acid. Since February 4th a variable quantity of bread was given daily. At first only 15 grams a day were allowed, later 15 grams three times a day. At present the patient receives 105 grams a day. On several occasions, when the patient ate surreptitiously more than the allotted amount of bread, small quantities of sugar reappeared temporarily in the urine. The presence of betaoxybutyric acid was determined by Dr. A. Bookman in the physiological chemistry laboratory of the Mt. Sinai Hospital. On October 19th, 8 grams of the acid were found, and on October 21st, 5.5 grams. No betaoxybutyric acid was found in November. The patient's weight on March 3, 1909, was 65 pounds, a gain of 5 pounds, 5 ounces since admission.

Diabetes occurs much less frequently in children than in adults. It is an extremely rare affection in infants under two years. According to various authorities children under ten years of age represent only 0.6 to 2.5 per cent. of all diabetic patients. No etiological factor can be discovered in this patient. The onset was apparently insidious, and it is therefore difficult to estimate the duration of the disease.

The prognosis of diabetes in childhood is considered to be very unfavorable, especially in cases where acetone, diacetic and betaoxybutyric acids are present. In these cases the duration of the disease is usually given as three to four months. In our patient acetone and diacetic acid were constantly present for over two months. There can be no question as to the improvement in the patient's condition since admission. Whether this is to be attributed to the diet or to the diet and medication, it is impossible to state. There has been a steady increase in tolerance for carbohydrates. In the early period, as was stated previously, the ingestion of some crackers led to the excretion of 48.9 grams of sugar within five days and on another occasion one-half cup of cocoa led to an excretion of 60 grams of sugar within twenty-four hours; whereas, now the patient is taking care of 105 grams of bread daily without any disturbance of sugar metabolism. The prediction as to the ultimate prognosis in this case can only be given with great reserve.

The subjective symptoms have almost entirely disappeared and there has been a fairly steady increase in weight. The polyuria, although not as marked as in the beginning, is the only persistent symptom.

REPORT OF A CASE OF FATAL VOMITING (RECURRENT TYPE) IN A CHILD.*

BY ELEANOR C. JONES, M.D.,

Visiting Physician, Children's Ward of the Woman's Hospital of Philadelphia.

The reported cases of recurrent vomiting are now quite numerous, but there are very few reported cases of fatal attacks, or of postmortem findings. This will serve as an apology for the present report.

Willie K., aged three years, was admitted to the Woman's Hospital November 23, 1907, and died November 25, 1907.

Family History.—Parents living. Father healthy. Mother very nervous. Maternal grandfather is a patient in the insane department of Blockley Hospital. There are three children in the family who are healthy.

Personal History.—Breast-fed. Had pneumonia and "gastric fever" when six months old. No history of any other illness in his life, except an occasional attack of vomiting in past two months.

History of Present Illness.—He began to vomit on November 17th, after eating a dinner of mutton stew, and continued to vomit at irregular intervals until November 20th, when his parents noticed that his head was drawn backward and that his hands and feet were twitching. He was very constipated from the beginning of his attack. He was admitted to the hospital on November 23d. His head was then retracted and he showed some twitching of hands and feet.

I first saw him on November 24th, and dictated the following notes: "Child looks badly. Expression shows exhaustion. Eyes sunken. Color dusky. Not markedly emaciated. Cry hoarse and respirations deep and slow and rather labored. Breath has a strong fruity odor. He is very restless, but his head is *not* now drawn backward and there is no twitching present of hands or feet. He is entirely conscious and does not complain of headache. He continually cries for water, but when it is given in the smallest quantity he vomits it immediately. Pulse strong and rate about 100. Temperature range, 97.6° to 101°. The knee-jerks not increased. Passes very little urine, and that involuntarily. Bowels have only moved twice since admission. Heart and lung sounds are normal. Liver large, edge felt just below border of ribs. Splenic area normal. Abdomen soft, flat and retracted. Tâche cérébrale not present." When the child was admitted to the hospital it was thought it might be a case of tubercular meningitis, but by the following day the meningeal symptoms had subsided and the diagnosis of toxic vomiting was made. Cultures were made from the secretions from his nose, but showed nothing conclusive, only a few staphylococci and another bacillus, probably the influenza bacillus. The child grew rapidly worse and died on November 25th. Some effort was made to give him bicarbonate of soda, but he vomited it, and afterward refused to take it. The urine was examined just after death by a drawn specimen and found not to contain albumin or casts, and the acetone reaction was not obtained by Dennege's test. The postmortem examination was made by Dr. Martha Tracy on November 26th. Heart and lungs were found to be normal. Spleen and pancreas also normal. Liver pale, larger than normal, and showed fatty changes. The gall-bladder was very much distended and measured three by one and three-quarter inches. The ducts were patulous. The right kidney was normal in size, and showed a congested appearance and punctate areas looking like hemorrhages under the capsule. The capsule stripped easily. Left kidney larger than normal, slightly congested appearance. Capsule nonadherent. Fetal lobulations persistent in both kidneys. The appearance of congestion and hemorrhage under the capsule were really due, as shown by microscopic examination, to deposits of pigments. Stomach normal in appearance and contained a small amount of mucus. Intestines and appendix normal. The thymus gland was enlarged, also the mesenteric glands. The lymph glands around the bile ducts were also hypertrophied. Sections from the different glands were cut, but did not show anything but thickening. Dr. A. W. Peckham made a careful microscopic examination of sections cut from the liver and kidneys with the following result: Liver capsule not thickened. Structure almost indistinguishable. The liver cells have undergone advanced fatty change, and there is considerable round-celled infiltration. The blood vessels are much dilated, and there is a deposit of pigment over whole structure. *Kidneys.*—Capsules nonadherent and not thickened. The cortices seem normal. The capillaries of the malphigian bodies are somewhat dilated and there is a very slight deposit of pigment in some areas. The glomeruli seem normal. The convoluted tubules are normal. In the medulla the epithelium of the tubules seems fairly normal. The blood vessels are very much distended and contain pigment, and there is a large deposit of pigment in the kidney structures.

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* Read before the Pediatric Society of Philadelphia, June 9, 1908.

The spinal fluid was also examined postmortem with negative results.

The postmortem appearances are rather different from any of the other cases I have found described. Griffith's case, reported in *American Journal of Medical Sciences,* 1900, showed necrotic changes in the mucous membrane of the stomach and intestines, slight parenchymatous alterations in pancreas, spleen and kidneys, and fatty infiltration of the liver. The postmortem findings in a case reported by Fred. K. Langmead in the *British Medical Journal,* February 18, 1905, showed liver large, and fatty degeneration present. Kidneys fatty, no nephritis. He says: "There was nothing definite postmortem, which could not be attributed to inanition and fever. The large size of the liver and extreme fatty changes were, however, very suggestive."

The renal changes in my case were not those of nephritis and show merely circulatory disturbances due probably to the attempts at elimination from the blood of the poisons and irritants produced in the body tissues. The liver was large and fatty, which is in line with the postmortem findings of the liver as reported by Griffith and Langmead.

In view of the difficulties of diagnosis in this case which I have reported, I wonder that there are not more cases reported of difficulties in the surgical diagnosis of cases associated with vomiting in children. I have only seen reports of 2 such cases. J. Swain (*British Medical and Chirurgical Journal,* 1906, Vol. XXIV.) reports 2 cases from the surgeon's standpoint. In his first case a child of four years vomited twelve days. This was almost the only symptom. Exploratory incision showed only congestion of the small gut and enlarged mesenteric glands. The child made a rapid recovery. In his second case a child of five years had vomited for six days, then complained of slight abdominal pain. An exploratory incision showed enlarged mesenteric glands as in the first case. The child died. A postmortem examination showed only enlarged glands and a fatty liver. The urine findings are not reported in these cases.

A brief résumé of the varying opinions that have developed concerning this symptom-complex is interesting. Gee's initial observations were made at the St. Bartholomew's Hospital in 1882 on 5 cases. He was of the opinion that it was a crisis of intestinal origin. Griffith, in 1900, writes that it "may perhaps be a neurosis, but if so is one of toxic origin in some way connected with faulty metabolism." Pepper, in the Supplement to Keating's Cyclopaedia, 1889, suggests the toxic origin with an appreciation of the nervous element in these cases. Rotch, in the edition of 1901, does not even venture a guess as to the source of the irritation, which is evidently, he says, outside of the stomach. Edsall made an important contribution to the study of this disease in 1903 (*American Journal Medical Science*). He states his belief that *no* specific toxic agent is at work, but that the symptoms are due merely to the presence of an excessive amount of acid, and are produced by the reduction of the alkalinity of the tissues of the body fluid and the loss of alkalies in the excretions, the acids carrying off the alkalies in combination with them. Hence, in the treatment, alkalies should be given in large quantities.

Rachford (ARCHIVES OF PEDIATRICS, 1904) believes a functional incompetency of the liver is an all-important factor; that the toxins produced are closely related to the purin bodies and that a secondary acid intoxication occurs, as shown by the acetone, diacetic and oxybutyric acids in the urine. Holt (edition 1906) regards the attacks as nerve explosions due to faulty metabolism. He says it is not probable that all the cases depend upon the same condition. Fischer (*Diseases of Infancy and Childhood,* 1908) merely mentions cyclic vomiting to ridicule it. He says he could always trace some dietetic fault or some autointoxication as an exciting factor of the vomiting.

The latest view of this symptom-complex, as expressed by R. Fischl, of Prague (Pfaunder and Schlossmann), is that it is sometimes an hysterical manifestation. In support of his view he states that a nervous heredity is often demonstrable. He cites also the sudden onset without recognizable cause, the severity of the symptoms and rapid subsidence, and return to perfect health. In favor of his hypothesis he states that the abnormal secretion of uric acid salts has been repeatedly shown to be present in hysterical attacks, and, finally, that the acetonuria may be only a consequence of marked disturbances of digestion.

My case is interesting because with the characteristic clinical symptoms of cyclic vomiting the urine failed to show the acetone reaction. The absence of nephritis in this case as confirmed by careful microscopic examination of hardened specimens, and the presence of the fatty liver with the marked round-celled infiltration, seem to be in accord with Rachford's view that liver incompetence is an all-important factor in the production of this symptom-complex.

THE NERVOUS CHILD.—Abt (*Lancet-Clinic,* Cincinnati, March 13th) discusses the causes of nervousness in children (of which heredity and predisposition are important factors), the acquired causes, the child's pleasures and amusements, troubles and griefs, in regard to which last he particularly condemns the habit of asking suggestive questions after an accident. He urges regularity of habits, discusses the effect of training, describes the forms of nervousness in children, and points out that it is necessary to manage not only the child, but also the parents and sometimes the grandparents.—*Journal American Medical Association.*

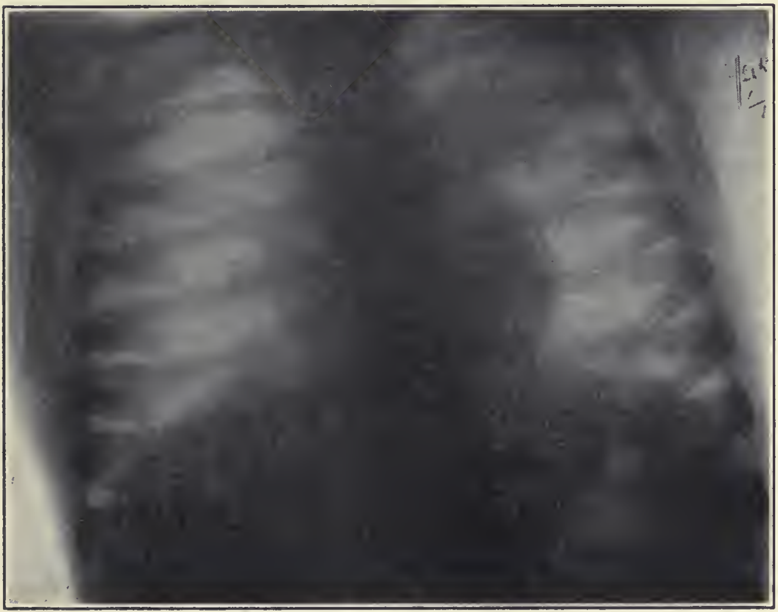
ALIMENTARY REGIMEN IN SCARLET.—Courdouan (*These de Paris,* 1907), as the result of a series of careful observations, concludes that chlorid of sodium does not play as important a rôle in scarlet as is ordinarily supposed. There is no retention of the chlorides in scarlet, and salt added to the food is without influence on the initial albuminuria, and appears to play no rôle in the contraction of the later nephritis. The curve of chlorid elimination is identical under different dietetic regimens, and the initial albuminuria disappears at about the same time, no matter what the diet. No form of diet can absolutely prevent the occurrence of nephritis. Milk diet is unquestionably insufficient, and causes loss of weight; but in all cases in which the urine cannot be very carefully watched a milk diet should be instituted. So too in all cases of scarlatinal nephritis milk should be the sole diet. Under other circumstances ordinary diet with an ordinary amount of salt may be used, as it is more comfortable for the patient, harmless and prevents undue loss of weight.—*Interstate Medical Journal.*

TUBERCULAR ADENITIS OF BRONCHIAL LYMPH GLANDS, PROBABLY CAUSING INTERMITTENT ATELECTASIS.

BY ROBT. L. PITFIELD, M.D.,

Visiting Physician, St. Timothy's Hospital; Pathologist, Germantown Hospital, Philadelphia, Pa.

From the accompanying radiograph it can be plainly seen that the area occupied by the lungs is here and there studded by masses varying in diameter from a pea to a dollar. In the absence of a postmortem examination it could not be verified that these masses were peribronchial glands, but the physical signs were not those of lung infiltration, nor did the sputum examination show that any tubercle bacilli were present in it.



Tubercular Peribronchial Adenitis.

The following case is reported because of the curious pressure phenomena in the left bronchus and apparently upon the sympathetic.

D. S., boy aged five, was admitted to St. Timothy's Hospital on the 8th of January, 1908, and from the history taken at that time it is quite evident that he had typhoid fever. This is amply verified by the clinical chart, diazo and Widal reactions. During this illness it was noted by Dr. H. M. Fussell that he exhibited marked symptoms of cerebral irritation such as tâche cerebrale, dilated pupils and stupor. It was noted in the history that Kernig's and Babinski's sign were absent. It was probably a case of cerebral intoxication, but not such as occurs in the course of typhoid. There could not have been much intercranial pressure at this time because of the absence of choked disc, but it was noted by the oculist that there was some retinitis.

It was noted before the little boy was discharged that there was a marked area of dullness in the left apical region of the thorax, which could be defined both anteriorly and posteriorly. Harsh breathing was heard over this area, which was irregular in size, being larger on some days than others, which is significant of some possible collapse of the left lung temporary in character.

On the 26th of October, 1908, he was readmitted to the wards with a history of a low fever, slight cough and listlessness, and of holding his head down, probably from photophobia. The family history was negative. Physical examination at this time revealed a few râles at the bases of both lungs, dullness and absence of heart sounds at the left apex. These sounds were never tubercular or bronchial in character, but they were marked by a singular irregularity. At times they were harsh and loud, while on the next day they were soft, feeble, very distant or else absent.

An examination of the mucus from the throat at this time failed to show any tubercle bacilli. The stools also were examined for bacilli without result. Von Pirquet's reaction was next tried, in order to confirm the diagnosis of tuberculous adenitis. There was no cutaneous reaction following the application of the tuberculin, but a sharp rise of temperature followed. After a few days Von Pirquet's test was again tried, and it was followed by a marked erythema (the secondary reaction of some writers). Moro's test was negative. A radiograph taken at this time confirmed the diagnosis. His cough at this time was trifling, and the heart sounds were normal but harsh; there were no moist râles. Because of the large mass situated above the heart and probably pressing on the left bronchus, a further elaboration was made in the diagnosis, to the extent that a large bunch of tubercular peribronchial glands pressed upon the bronchus, intermittently causing an atelectasis when the bronchus was occluded. It was assumed that the dilated pupils were due to pressure of the glands upon some fibers of the sympathetic which is given off from the cord at the level of the first dorsal vertebra.

The Von Pirquet test was first tried on November 2d. On November 13th the child showed marked evidences of tuberculous meningitis, with retracted belly, stiff neck, high fever, aposthotonos, unequal pupils, superficial respiration jerky in character, followed in three days by death in coma, in two weeks after the application of the tuberculin to the skin and blood.

This raises the question, did the tuberculin, causing a thermal reaction, excite the meningitis by dissemination of the tubercle bacilli?

In the absence of an autopsy it cannot be positively held that the masses were peribronchial glands, or that the intermittent heart sounds, increasing and diminishing area of dullness, were due to an atelectasis of that portion of the left lung supplied by the underlying bronchus.

5211 Wayne Avenue.

A FORM of acute tuberculosis in children was described by Landouzy at the American Tuberculosis Congress. It is characterized by continuous fever, quick pulse, and splenic enlargement, but lacks at first local indications. The points of difference from enteric fever are the great irregularity of the pyrexia and the high pulse-rate, besides, of course, negative Widal reaction and absence of rose spots. The condition clears up gradually, signs of deposits in the lungs, pleura or mesenteric glands then becoming evident. The serum test for tubercle may be obtained, and a similar state of "tuberculous sepsis" can be produced artificially in animals. Landouzy has made several generalizations on tuberculosis, among others that children who have undergone tracheotomy often die later of consumption, and that almost all emphysema is of a tuberculous nature.—*Hospital,* January 30, 1909.

ACUTE DILATATION OF THE STOMACH IN INFANCY, WITH REPORT OF ONE CASE.

BY WILLIAM PALMER LUCAS, M.D.,
Assistant in the Department of Pediatrics, Harvard University Medical School;
Boston, Mass.

Late one evening during my service as medical house officer at the Children's Hospital, I received an emergency call to the babies' ward. There I found an eleven months old baby apparently dying. His face was a peculiar ashen, bluish white; the moisture on the forehead was very marked; the eyes were rolled up, and he presented the picture either of sudden asphyxia or of heart failure. I was told that while the baby was nursing in his usual ravenous fashion he had suddenly given a short gurgling gasp, had straightened out, rolled his eyes and seemed, to all appearances, about to die. Placing my hand upon the child's abdomen, I found what seemed to be a greatly distended epigastrium. With my fingers and thumb as widely separated as possible, I grasped the abdomen and made a firm pressure downward and slightly up toward the chest. The feeling was that of grasping a balloon hidden under the abdominal wall. In a moment, as if a definite resistance had been overcome, air came up and a gush of milk. There was an immediate change in the appearance of the child. The color came back, there were a half dozen short gasps and then gradually the normal breathing. The eyes became natural and the child began to cry quite lustily. A stomach tube had been ordered and a hypodermic of brandy and aromatic spirits of ammonia. By the time the former was brought it was not needed; the latter was given though the child was then apparently out of danger. There was time then to reflect on what had happened. It will be interesting here to note the history and examination of the child on admission two days previous.

V. J., age eleven months. Family history is negative. There is one other child living and well. Both father and mother are perfectly healthy. The child was a full term baby with normal delivery. Breast-fed for five months. Since then he had been getting various proprietary foods with milk but had never done well. On December 25th the child had a convulsion; another on the 29th and again one on the morning of the 30th, the day of admission. The baby took food very well and seemed normal between convulsions. He was, however, rather poorly developed and nourished. Skin was clear throughout. Examination of the head was negative. The thorax was well formed with a suggestion of a rosary. The lungs were resonant throughout. There were no râles and no cyanosis. *Heart*—apex beat in the fifth interspace, just in the nipple line. The beat was forcible and heaving and had a suspicion of a thrill. Dullness extended 1 cm. to the left of the nipple line and to the right border of the sternum. There was a loud systolic murmur, plainest at the apex, heard all over the precordia and in the axilla and in the back. The abdomen was prominent, tympanitic, slightly more prominent between the ribs and umbilicus than below. No peristalsis noted, no masses palpable. Liver edge 2 cm. below costal border. Spleen not felt. Reflexes were normal. Glandular system was not enlarged. Roentgen ray pictures did not show the stomach at all enlarged.

The conclusions are clear. The previous attacks of convulsions, which, by the way, on more careful questioning of the mother, I learned to be somewhat similar to the attack just described, and were always followed by copious belching of gas and rather copious vomiting, were doubtless due to the same cause, acute dilatation of the stomach, which had been relieved spontaneously. Whether or no this would in this instance have ended in the same happy way without assistance can never be told, but at the time it certainly did not appear to be the ending about to be reached.

In looking up the literature I have found but 2 cases of acute dilatation of the stomach in infancy—one by David A. Bililios, in the *British Medical Journal* of January 10, 1903, p. 74, in which a child apparently healthy and with no previous history was found dead two hours after nursing. There was no apparent cause. The abdomen, especially the upper half, was greatly distended, and on autopsy the stomach was found as large as a football. There was no obstruction. The duodenum was not dilated. The stomach contained a small amount of milk, but a great amount of gas. The second case was reported by Cooper, in the same journal, for April 18, 1903, p. 910. The report was apparently stimulated by the report of Bililios' case. A perfectly healthy child of eleven months shortly after taking his food, while laughing and playing, suddenly seemed to stop breathing. He "made a noise in the throat," became insensible and died in a few minutes without a struggle or a convulsion. There were no signs of rachitis or syphilis. The child was dead when the physician arrived. The upper abdomen in this child was also very prominent. Autopsy showed the stomach greatly dilated, containing nineteen ounces of food and a considerable quantity of gas. The heart muscles were pale and flabby. Nothing else was found to account for the sudden death.

Dilatation of the stomach in cases of pyloric stenosis is not an unheard of occurrence and is neither rare nor to be wondered at, but acute dilatation where there is no obstruction appears to be a thing at least seldom spoken of, though it seems to me perhaps not as uncommon as this would indicate. Doubtless some of the sudden deaths in infancy which go unaccounted for might be laid to its door. In the case of a baby who nurses rapidly or one that takes in a good deal of air while nursing, which we know is not an uncommon thing, but which fortunately for the baby most frequently causes vomiting, there is no reason apparent to the writer why some of these cases should not have a sudden stretching of the stomach walls; and this perhaps with a pale flabby heart musculature could cause sudden death. The probable causes, then, might be summed up in rapid nursing with the simultaneous ingestion of a greater or less volume of air, with the normal safety valve of vomiting omitted, in a child with perhaps not too strong heart muscles. General atony of all the muscles, delayed emptying of the stomach from any cause, whether organic or functional, the generation of gas and fermentation or overfeeding may be causes. A baby's stomach has certain definite limitations and going beyond these limits may at any time cause a rapid dilatation from muscular fatigue. Gluttony in older children is not an uncommon cause nor would it seem to be so in infancy. In older children acute dilatation is not an uncommon occurrence though a chronic or subacute dilatation is perhaps more frequent from a variety of causes, as debility, overeating, indigestible and easily fermentable food-stuffs, especially those rich in carbohydrates, constant general muscular fatigue, nervousness, overstudy, anemia, chlorosis, rachitis, syphilis, sudden fright and overwork, whether brain or muscle, have all been attributed with having caused one or another form of dilatation. Poor teeth have also been assigned the cause for certain conditions of gastric dilatation, as also have underclothing, underfeeding and insufficient sleep. Carl Beck has mentioned the occurrence of acute dilatation in children occurring after operations and has collected a number of such cases.

The symptoms arise suddenly. There is a reflex holding of the breath, an involuntary spasm of the throat muscles and also of the esophageal opening of the stomach which prevents vomiting, a more or less cyanotic ashen hue, a few gasps, a profuse perspiration. The case I report was cold and clammy all over. There is always a feeble heart action due to the sudden interference by pressure from the dilated stomach, rapid insensibility with or without tonic spasm of the muscles and most often rapid death.

There is one and only one remedial measure—empty the stomach as quickly as the opportunity is afforded you and the secondary stimulation and quiet that any great crisis would call for. The after-treatment is merely the preventing of such an accident—slower feeding and breaking the child of the pernicious habit of taking in air with its food—a habit which, alas, is as hard for the child to overcome as for the adult who is given to this practice.

In reporting this case I am in hopes that it will have the same effect as did the report of Bililios. I am much indebted to Dr. Thomas Morgan Rotch, on whose service at the Children's Hospital this case occurred, for the privilege of reporting this rather uncommon incident.

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SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held March 11, 1909.

DR. ELI LONG, CHAIRMAN.

A CASE OF EXOPHTHALMIC GOITRE IN A GIRL TEN YEARS OF AGE.

DR. M. NICOLL, JR., presented this patient. The father was an Austrian Jew, forty-three years old, a cigar maker. Complained of gradually increasing nervousness and physical weakness and had given up work on this account for several weeks. The mother presented nothing of clinical interest. The two youngest children, three and six years of age, seemed normal. A girl of nineteen, whom Dr. Nicoll had not seen, was said to be strong and well. The oldest son, a boy of seventeen, had lately given up college because of nervousness and weakness. His thyroid gland at its upper part showed no hypertrophy. His eyes were somewhat prominent. His pulse was 120 to 142. A fourteen-year-old sister came to the clinic about six weeks ago to be treated for asthma, which was said to have been present at irregular intervals for years. The ten-year-old girl came to the clinic some weeks ago to be treated for the eyes. She appeared to have an exophthalmus, fairly well marked von Graefe sign, and marked pulsation of the retinal vessels. The thyroid was distinctly enlarged. Her pulse varied from 120 to 145. She was moderately nervous, but attended school regularly. Her urine was normal.

DR. JOHN ROGERS, JR., said that among the interesting things in connection with the cases presented by Dr. Nicoll were the apparent heredity and the diagnosis. He firmly believed in heredity increasing the susceptibility to the disease in these cases. With regard to the diagnosis of exophthalmic goitre, there appeared to be in these cases one characteristic feature, "fatigability," that was, little ability to withstand exertion, fatigue, or excitement. Fatigability was probably one of the most common and characteristic things in exophthalmic goitre, and when one or two signs were added there was not much doubt about the diagnosis.

The condition, he thought, could be made worse or better by the administration of thyroid or thyroid products. What had been written in the past regarding the iodin content of the thyroid gland was probably all wrong; one chemist, Dr. Riggs, had been working in the Cornell Medical School laboratory for two years to determine the iodin content of the thyroid gland, and he had proven by his quantitative methods that the ideas in vogue regarding the thyroid gland and its iodin content were extremely erroneous. Practically all the determinations which had heretofore been published could be thrown out. In exophthalmic goitre the content of iodin in the gland in proportion to the total weight of gland was very much diminished from the normal; this diminution was in direct proportion to the severity of the disease. This was probably due to some vital defect in the gland with a failure to take up iodin. These patients were not only susceptible to thyroid, but were susceptible to iodin as well. The patients could be made better or worse by the administration of small doses of iodin, showing their great susceptibility to this agent.

With regard to the theories as to the etiology of the disease, here was presented something of interest in the family. One girl had asthma; another girl suffered from headaches and constipation and disorders of digestion; the boy was feeble; the father showed mental defects. This seemed to show that the thyroid was intimately connected with nearly all the organs of the body. Any strain upon the nervous system made the disease worse; any strain upon digestion aggravated the disease. Diarrhea made the disease worse. Any intercurrent affection, such as tonsillitis or any infectious fevers, made the disease worse. With such a multitude of conditions bearing upon the disorder of the thyroid gland, it appeared that the thyroid gland was concerned in the action of every tissue in the body. He thought this gland was concerned in the fundamental chemistry of every organ and tissue in the body and thus had an "activating" effect upon each. Both the quantity and quality of the secretion had to be considered in every case. In some the quantity of secretion was too great and the amount had to be cut down by means of surgery or by a specific antiserum. In others, as in the cases shown, the quantity of thyroid secretion was probably not in excess, but the quality was impaired and therefore the gland had to be helped out, as it were, preferably by one or another of the pure (?) thyroid proteids or by iodin—at the same time every effort should be made to improve the general nutrition, as this in turn affected the thyroid and the quality of its output.

A CASE OF INOCULATION TUBERCULOSIS FOLLOWING RITUAL CIRCUMCISION.

Dr. Sara Welt-Kakels read this paper. A child of six months, born of healthy parents, was circumcised when nine days old by an elderly man who had, presumably, tuberculosis. The wound, according to the orthodox custom, was sucked. At first it was somewhat inflamed and the child suffered from slight malaise. Four weeks later there was a glandular swelling in the left inguinal region. This later became fluctuating, was aspirated, and in the discharge from the sinus resulting, tubercle bacilli were demonstrated. Von Pirquet was positive. When the glands were removed later sections of them showed tuberculous giant cells, areas of cheesy degeneration and tubercle bacilli, as did also smears from the fresh glands. At six months the child looked perfectly well and strong, quite in contrast to the generally recognized condition of tuberculosis in an infant, but in Dr. Welt-Kakels' opinion the probability of recurrence and extension was great. The case should point out the need of proper precaution in ritual circumcision to avoid such complications.

Dr. Henry Koplik said that these cases of inoculation tuberculosis were met with from time to time, but they were becoming more rare with the enlightenment of the gentlemen who performed this rite. These children usually go to the wall, develop other forms of tuberculosis and die. Of the cases that he had seen, the earliest appeared three months after the circumcision.

Dr. Charles Goodman said that the interesting presentation of this case called attention to some of the grave dangers of the ritual circumcision as practised by some of the Mohels, and emphasized the necessity of calling the attention of the Board of Health to the pernicious habit as practised by unqualified and ignorant Mohels. The licensing of only competent and properly instructed Mohels would do away with the dangers to the innocent offspring under the present indiscriminate methods pursued.

Dr. Martin W. Ware said he wished to confirm all that Dr. Welt-Kakels had stated. After a period of incubation of four weeks the glands enlarged and the lesion would assume the characteristic appearance of a tuberculous sore. This coincided with the first appearance of the luetic adenopathy, while the sore could pass for either one of lues or tuberculosis, thus rendering the clinical diagnosis somewhat difficult.

As bearing on these cases of inoculation tuberculosis, he reported another case of inoculation tuberculosis occurring in an infant of six months, who had had her ear pierced by the nurse. The nurse threaded a needle, then drew the thread through her mouth to wet it, and pierced the baby's ears. This resulted in a sore which refused to heal kindly with the string or thread in the ear. The glands in the neck became enlarged. Dr. Ware did for the child all that surgery could do, and this resulted in prompt healing of the sores, but six months afterward the child developed a spondylitis. This occurred nine years ago, and to-day the child was otherwise well.

A CASE OF DIABETES IN A BOY OF TEN YEARS OF AGE.

Dr. Henry Heiman presented this case. (See page 442.)

Dr. Rudisch said the case presented by Dr. Heiman was of particular interest because of the age. In such young persons the prognosis is usually considered very unfavorable.

Here was a child of ten years, with diacetic and oxybutyric acids in his urine, taking carbohydrates all the time at home. In accordance with the teachings regarding the diet in the presence of these acids, he continued the patient on a limited diet of carbohydrates. The diacetic acid did not disappear from the urine. In such cases all authorities agree that a certain amount of sugar is indicated, and under this impression he gave the child fruit—oranges and apples—hoping that the levulose contained therein would not be as deleterious as starch and dextrose. He then decided to stop this, and give the patient an absolutely strict diet of proteids, including only meats, fish and such vegetables as contained small quantities of starch, especially cabbage. This boy required enormous quantities of food to satisfy his hunger, therefore cabbage and other bulky vegetables were given in order to fill his stomach. It has been shown that in certain portions of Europe, where the people eat large quantities of cabbage and potatoes, if meats are substituted they complain of hunger. And so it was with this boy. His stomach had to be filled. After a time he took smaller quantities of food. Under this diet the diacetic and oxybutyric acids disappeared from the urine, proving that the presence of these acids is not always a contraindication to a strict proteid diet, contrary to the opinion of most authorities. From his experience he had found that one could decrease the amount of sugar excreted, and increase the tolerance for carbohydrates much more rapidly by the administration of atropin salts combined with diet than by diet alone. This patient was started on sulphate of atropin, beginning with small doses, about $^1/_{200}$ grain three times a day. The patient's urine became sugar free, however, only when the dose was increased gradually to $^1/_{80}$ and to $^1/_{60}$ grain three times a day. It is very important to increase the dose of atropin sulphate very slowly.

The prognosis in these cases is doubtful, and the treatment must cover a long period of time. These young patients should be kept in the hospital where they can be watched with care, as they have a great craving for crackers, bread and the like, and will use every means to obtain them surreptitiously.

PNEUMONIA: A BEDSIDE AND LABORATORY STUDY.

DR. AUGUSTUS WADSWORTH read this paper. He emphasized the prominence of the pneumococcus in the bacterial etiology of pneumonia and the secondary or complicating rôle of the bacillus of Friedlander and the streptococcus. Animal experiments usually failed to reproduce the lesions of pneumonia as found in man; death usually supervened from a general bacteriemia and when lung lesions were found they were, as a rule, of the bronchial type in cases of less resistance and of the lobar type in cases of greater resistance. A general bacteriemia was generally present in all stages of the disease. Bedside experience had shown that except in unusual cases the extent of the lung involvement did not correspond to the severity of the symptoms so much as did the failure of the circulation. Antitoxins in the absence of a toxin were impossible to secure. Hiss' leukocytic extract seemed to prolong the infection and to save life. In the management of cases of pneumonia the physician's aim should be to avoid those measures which would interfere with the development of immunity.

DR. DAVID BOVAIRD, JR., discussed the relative importance of the local lesion and the general infection and the vagaries of the disease in the strong and in the weak.

DR. HANS ZINSSER discussed the paper from the standpoint of the most recent studies in immunity.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Meeting held April 13, 1909.

J. Claxton Gittings, M.D., President.

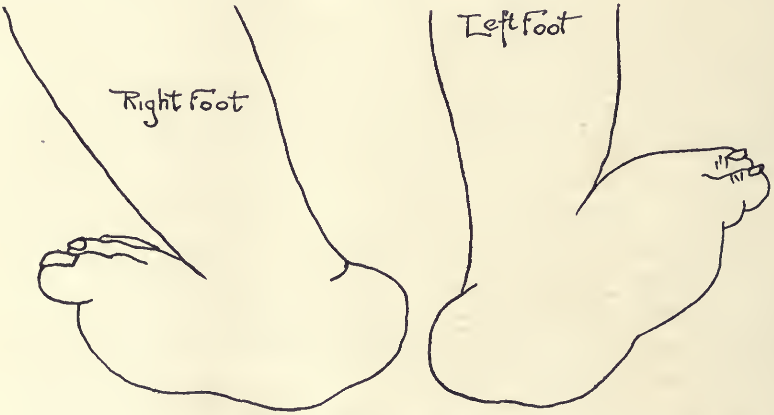
LATERAL SUBLUXATION OF THE KNEE IN AN INFANT.

Dr. J. T. Rugh showed the child, now nineteen months old, who had first been seen four months previously. She was the sixth child, and was breast-fed for thirteen months. Her only illness had been an attack of "some pulmonary trouble" between four and six months, during which she cried bitterly when picked up, showing some evident joint tenderness. She cut her first tooth at seven months, but did not walk until seventeen months. At fifteen months the mother first noticed a snapping of the left knee when it was moved freely, apparently causing no discomfort. Dr. Rugh saw it two weeks later, and found the cause to be lateral subluxation of the knee. There was marked relaxation of the structures about the knee and the dislocation occurred when the leg was in partial flexion and the foot turned toward the other knee. Other joints were markedly relaxed and there was evidence of malnutrition, but many of the signs of rickets were lacking. The child is now walking and improving constantly under proper hygienic treatment.

DOUBLE CONGENITAL CALCANEOVALGUS.

Dr. G. G. Davis showed a child now over three years old, whom he had first seen soon after birth. His general condition was so poor that there was doubt whether he would live. The feet were flexed so markedly that the dorsum was in contact with the anterior portion of the leg. They were also everted and there was considerable prominence instead of a hollow in the soles of the feet. They were rotated outward so that the patellæ pointed laterally instead of anteriorly. The knees were also somewhat contracted. Treatment was first directed to the child's general condition rather than to correcting the deformity. The mother was instructed to stretch the feet daily and bring them as near as possible into a normal position. As the child improved more forcible stretching was done with the hands, the feet being put into plaster bandages every few weeks. For a time tin splints were used, replaced by apparatus as the child grew. Manual stretching was, however, continued,

To correct the valgus the foot was firmly laced in the shoe, aided by a double instep strap. To prevent calcaneus a heel strap was employed. To straighten the knee the apparatus was locked at the knee joints and a knee cap was used to draw them back and so favor extension. To correct external rotation the apparatus was carried up to a waist band, which position kept the toes pointing forward. By these measures the deformities were largely overcome. The child was doing well and walking when he caught pneumonia and for the past six months treatment has been neglected. While the case has relapsed considerably, the conditions are far better than they were at birth. The prognosis, with continued treatment, is very good. No operation was needed. While valgoid conditions are not rare, such a degree of equinovalgus as exhibited by this child is very seldom encountered.



Showing Double Calcaneovalgus.

Dr. Rugh expressed regret that Dr. Davis had not discussed the etiology of this case, as this was always most interesting to him. The slight flexion of the knees, together with the peculiar facial expression and uncertain head movements, pointed to some cerebral lesion as the cause. Calcaneovalgus was not uncommon in the newborn, but in those cases in which there was no lesion of the central nervous system the condition almost always corrected itself or was very easily corrected by manipulation or mechanical means.

Dr. Davis said that Dr. Rugh's case was a good example of the cases brought to the orthopedist because they could not walk. Examination of many of these cases showed no definite cause beyond rickets, which needed treatment.

POTT'S DISEASE.

Dr. James K. Young showed a woman of forty-five years, who had come for treatment after having suffered five years without any local treatment. She had had a large lumbar abscess for four years, finally operated upon by a gynecologist. Under the use of a Taylor spine brace the abscess closed in four months and she has remained perfectly well since. She exhibits a high degree of deformity, her height being now less than a girl of ten years.

Dr. Young then showed a girl of ten, whom he had seen first four years ago, with deformity already produced in the upper dorsal region and paraplegia. He devised an apparatus fixing head, neck and spine in one piece. She was placed in a wheel coach of special design upon a tray, making pressure upon the posterior part of the spine. She made a perfect recovery and shows a straight spine, while those who saw her wear her cuirass were surprised at the comfort she experienced in it.

THE EARLY DIAGNOSIS AND THE TREATMENT OF POTT'S DISEASE.

Dr. Compton Riely, of Baltimore, Md., read this paper by invitation. Early diagnosis meant the detection of the trouble before the occurrence of angular kyphosis, marked sensory or motor disturbances or palpable abscess. The disease was almost, if not as frequent, in adults as in childhood, but manifested itself differently in the two ages, being commonly diagnosed in the adult as disease of some organ or organs, on account of its slower progress and the more frequent unilateral pains which remained in one location longer, due to the larger size and greater proportion of mineral salts in their bones, which offered a greater resistance to the tubercle bacilli. There were also some differences in female adults, referable to the female generative organs.

The early symptoms were transmitted pains at any part of the body or limbs below the seat of the disease, unilateral or bilateral, more severe at night and intermittent in character; weakness; stiffness; numbness; tingling of the limbs; loss of appetite; sleeplessness; malaise; slight elevation of evening temperature; enuresis in children; frequent urination in adults, increased by exertion; persistent constipation, nausea and uncontrollable vomiting at times, persisting hours or days, especially in adults; grunting, painful respiration, coughing or sonorous breathing; nervousness, excitability, irritability, hysteria and neurasthenia, more common in female adults; pelvic pains and various menstrual disturbances in females past the age of puberty, with exaggeration of all other symptoms at the menstrual epoch, often causing them to undergo various operations from which they derived no benefit.

The early physical signs were guarded gait; restful attitudes standing or sitting; inability to bend or stoop without effort or pain; forward tilting and projection of the pelvis; rigidity of the muscles of the trunk and neck, especially the abdominal muscles; increased obliquity and coaptation of the ribs; anteroposterior flattening of the chest; increased lordosis of the neck or lumbar region; increased backward projection of the dorsal region; increased tension of one or both of the psoas muscles at times; slight angular bend of the spine; increased deep knee reflexes; night cries, night horrors and moaning. All of these symptoms and signs might be increased by jarring from riding, driving, walking, bending, lifting, stooping, etc. Patients presenting many or all of these signs and symptoms with a history of gradual onset and long duration, which have resisted medical and surgical interference, should lead one to suspect strongly Pott's disease and a radiograph should be taken in the following manner: With a tube sufficiently soft to show the bones fairly dark, making a longer exposure, with the tube 25 to 30 inches from the plate. In tuberculous disease of the spine, even before sufficient bone destruction had occurred to be detected, such a skiagraph would show a shadow of a cold abscess and will greatly aid in making an early diagnosis.

Dr. Riely showed a number of radiographic lantern slides showing tubercular abscess in patients whose ages ranged from seven to forty-five years, whose histories were similar. Proof of his interpretation was that in some of the cases the abscess was actually opened. He also showed lantern slides of typhoid spines, rheumatoid spines and aneurisms, and explained how to differentiate the shadows of these conditions from cold abscess.

In both the ambulatory and recumbent methods of treatment the objective aim was to restore the anterior projecting and tilting pelvis to its normal posture, which would produce better straightening of the spine, restore the ribs and chest to normal condition and relieve symptoms. Recumbency was advised during the acute stages, with extension and hyperextension upon double irregularly curved inclined wooden planes, which should be shaped to suit the requirements of the individual, so as to hyperextend the spine at the seat of the disease. The ambulatory method was advised for high and double lesions, and consisted of a shell aluminum brace that would support the whole spine and head, made over a metal case, the model of which has been obtained from an impression of the patient's back, neck and back of head, corrected so as to reduce the lateral deviations, the lordosis in the cervical and lumbar regions, and the round shoulders or kyphosis in the dorsal region; the amount of correction depending on the amount of deformity, that of the severer forms being more gradual. Where the trouble was below the eighth dorsal vertebra, a special spinal correcting apparatus which accomplished the desired corrections during the application and setting of a plaster case would be needed.

Dr. Young said he was much interested in the subject as presented by Dr. Riely, especially the value of the use of the cuirass in the treatment of Pott's disease and had discovered the value of this in treating the patient who was presented this evening. He had shown this patient at a meeting at which Dr. Riely was present. The first apparatus was made of felt; other cuirasses have been made of celluloid, which were found very light and satisfactory, but they could not be changed in shape as well as those made of aluminum, which was first employed in this manner by Dr. Riely. A similar cuirass to the one which Dr. Young used had been employed by Dollinger of Budapest.

Dr. Rugh said where the focus of disease was high he relied more upon plaster of Paris applied in suspension. Each case, however, must be treated according to its own indications. For the past year Dr. Rugh had been employing the old treatment of abscesses by aspiration, washing with normal salt solution and injecting 10 per cent. emulsion of iodoform with remarkable results. Many very large psoas abscesses have disappeared under one aspiration. For sinuses he employs bismuth paste, but for the distinct abscesses and as an antituberculous agent he considered iodoform to be superior.

Dr. Riely added that he had abandoned the use of hard felt, as it could not be made properly. In old sinuses he considered Beck's paste better than anything he had used.

NEW BED FRAME.

Dr. J. M. Spellissy, by invitation, demonstrated a new bed frame.

General Paresis in Children.—Fairbanks (*Journal American Medical Association,* December 5, 1908) describes general paresis in children. He states that it invariably occurs before the fifteenth year, is equally divided between boys and girls, the course is longer in the child than in the adult, the onset is characterized first by mental deterioration, followed by tremor, disturbances in gait, change in reflexes, etc., the most marked being the muscular instability. The course is steadily progressive, lasting from one to nine years. The only other condition with which it is compared is cerebral syphilis. He believes that syphilis is beyond doubt the etiologic factor.—*Boston Medical and Surgical Journal.*

Erysipelas in the New-Born.—A. Herrgott (*Annales de Gynecologie et d'Obstetrique,* May, 1908) describes erysipelas in the new-born infant as a very serious and generally fatal disease. The fatality depends on the absence of reaction against the germs, due to the absence of phagocytosis in the new-born child. After the age of three months the prognosis is quite otherwise because here phagocytosis goes on normally. Starting from the solution of continuity at the umbilicus the germs enter the tissues and are not opposed by the lymphatic glands. They enter the lymphatics of the subcutaneous tissues, where they are found in great numbers, as also in the outer coats of the blood vessels. A rapidly fatal peritonitis closes the scene. The external redness and swelling are slight, the symptoms of peritonitis being the first seen. Treatment has no effect.—*Medical Record.*

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CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. G. C. ALBEE.	DR. C. D. MARTINETTI.
DR. HENRY HEIMAN.	DR. CHARLES OGILVY.
DR. ALFRED F. HESS.	DR. G. R. PISEK.
DR. LINNÆUS LA FÉTRA.	DR. S. W. THURBER.

DISEASES OF EAR, NOSE AND THROAT.

PHILLIPS, WENDELL C.: THE PRESENT STATUS OF THE RADICAL MASTOID OPERATION FOR THE CURE OF CHRONIC PURULENT OTITIS MEDIA. (*The Ohio State Medical Journal,* February 15, 1909, p. 65.)

It is the author's belief that if all acute cases of otitis were subjected to the proper treatment the chronic form would be almost unheard of. It is probable that a large proportion of chronic cases have, at some time, had mastoiditis from which recovery has taken place without operation, but with loss of hearing, chronic discharges and bone necrosis.

The treatment may be classified under three heads: (1) Local measures, (2) intratympanic operation and (3) the radical operation.

This last is done to convert the external auditory canal, tympanic cavity, attic, aditus ad antrum, mastoid antrum, and, if necessary, the mastoid cells, into one wide open cavity; eviscerating all granulations and diseased bone, destroying all membranes and muscular tissue and effecting dermatization so that the disease will be terminated once for all.

There are several dangers attending this extensive measure: (1) Injury to the facial nerve; (2) damage to the internal ear; (3) stirring an old encapsulated cerebral abscess into renewed activity; (4) occasional injury to the dura with resultant meningitis. The percentage of complete cures is not more than 65 per cent. Even under these comments and figures the author believes the operation is justifiable in a limited proportion of cases of chronic purulent otitis media, and the operation is indicated (*a*) when intratympanic treatment has been of no avail; (*b*) when symptoms of acute mastoid involvement are present; (*c*) when a sudden cessation of discharge produces vertigo and pain;

(*d*) if facial paralysis should appear in the course of a chronic otitis; (*e*) in intracranial or sinus involvement; (*f*) where there are symptoms of cholesteatoma in the mastoid antrum; (*g*) where there are fistulous openings into the mastoid cells.

The operation is contraindicated: (*a*) When the process is tuberculous; (*b*) in advanced pernicious anemia, albuminuria or diabetes; (*c*) usually in young children; (*d*) where the disease is confined to the tympanic cavity; (*e*) in cases where it is possible to affect a cure by the simpler methods described in this article.

His reasons for advising against the operation in young children are as follows: (1) The disease is rarely extensive enough to require it; (2) the disease usually yields to local treatment provided adenoids and tonsils are removed: (3) a cure usually results by establishing free drainage through a large perforation; (4) it is not wise to destroy hearing in the young. He would oppose performing the double radical operation except to save life.

S. W. THURBER.

DENKER, ALFRED: OPERATIVE TREATMENT OF MALIGNANT TUMORS OF THE NOSE. (*Annals of Otology, Rhinology and Laryngology,* December, 1908, p. 959.)

The author describes his method of operating through the mouth, which obviates the cutting of the skin of the face, lessens bleeding and gives a good view of the field of operation. The upper lip is drawn up and the incision made to the bone from above the rear molar tooth, horizontally forward to a point from 2 to 3 cm. past the middle line of the face in front. All the soft parts are separated from the bone. The antrum, nasal cavity, ethmoid and sphenoid cavities may be entered by this route, and after removing all suspected bony parts the wound is packed and the oral mucous membrane sewed up. Permanent disturbance of the lachrymal apparatus has never happened, nor is there loss of teeth.

Besides reporting this operation on several adults, the author has performed it on a girl of eight years, who has a fibrosarcoma of the lamina cribrosa, which filled the nasal cavity. The growth recurred twice, with some change in the character to simple fibroma. The prognosis of all tumors arising from the roof of the nasal cavity is grave. The after treatment of this operation is simple and patients are generally discharged from the hospital in two weeks. S. W. Thurber.

PATHOLOGY.

Roemheld, L.: Postdiphtheritic Pseudotabes. The Cerebrospinal Fluid in Postdiphtheritic Paralysis. (*Deutsch. Med. Woch.,* April 15, 1909, p. 669.)

The author reports that in cases of postdiphtheritic paralyses pathologic changes may be found in the cerebrospinal fluid. No previous examinations have been published in this complication of diphtheria. The changes consist in a marked increase of albumin, and a moderate increase in cellular elements, both of which tend to diminish as improvement takes place. However, when organic lesions of the central nervous system persist, the cerebrospinal fluid seems also to maintain its pathologic condition. These facts seem to show, for the first time, that a diphtheritic paralysis of long duration is not merely a neuritis, but a disease of central origin. It is uncertain whether the alteration of the spinal fluid should be considered toxic in nature or whether it is due to a previous meningitis; the author inclines to the latter opinion. He suggests that we may be permitted to draw an analogy between this condition, which follows an infectious disease, and the metasyphilitic changes of the same nature found in the cerebrospinal fluid—that they both may have a common origin.

Alfred F. Hess.

Wile, Ira S.: Interpretation of Blood Examinations. (*Medical Record,* October 24, 1908, p. 709.)

Wile calls attention to the relative percentages of leukocytes in the first ten years of life and gives a table of the normal percentages for each year. The total leukocyte count is an index of the individual reaction to infection, while the percentage of polynuclear neutrophiles is a guide to the intensity of the infection. Myelocytes in children are of less serious portent than in adults. Blood examinations only elicit symptoms and make a diagnosis only in cases of malaria and filariasis. Hematology should be considered a clinical adjunct similar to urinalysis and interpreted as rationally. G. R. PISEK.

VON STARCK, W.: THE BASOPHILIC GRANULATIONS OF THE RED BLOOD CELLS IN THE BLOOD OF THE EMBRYO AND ANEMIC CHILDREN. (*Jahrb. für Kinderhk.*, March 1, 1909, No. 69, Vol. III., p. 264.)

These are found in the blood of embryos and anemic individuals. Their presence is not pathognomonic of any one blood disease. The granules are probably not derived from the nuclei. Not only are these cells found in the blood, but also in the bone-marrow. The author shares Naegeli's view that they probably represent a pathologic regeneration of the blood, rather than a degeneration. HENRY HEIMAN.

HELMHOLZ, HENRY: DUODENAL ULCERS IN INFANTILE ATROPHY. (*Deutsch. Med. Woch.*, March 25, 1909, p. 534.)

The author reports 9 cases of this rare condition. In 6 instances an autopsy was performed and one or more ulcers found in the duodenum near the pylorus. The etiology in 1 case seemed to be a thrombosis at the site of the ulceration. In 8 cases the infants died either within a few hours of the onset of the intestinal hemorrhages or after a few days, during which interval there was a marked loss of weight. Besides the melena there was no characteristic symptom; in no case was hematemesis present. Subcutaneous injections of gelatin and feeding with small quantities of breast milk are recommended in the treatment.

ALFRED F. HESS.

ORTHOPEDIC SURGERY.

REINER: PRINCIPLES OF THE TREATMENT OF CONGENITAL DISLOCATION OF THE HIP. (*Versammlung Deutscher Naturforscher und Arzte im Köln,* September 20, 1908.)

Reiner attributes nine-tenths of the postoperative reluxations of congenital dislocation of the hip to the antiversion of the neck of the femur. He strongly advises the correction of this deformity before attempting the reduction of the dislocation. Reiner assumes that in the abducted primary position after reduction the neck of the femur is directed upwards and the head of the femur presses upon the roof of the acetabulum, and even in the bandage reluxation can take place. Reiner contends that the primary, rather than the subsequent, correction of the anteverted neck is demanded, because in the former the acetabulum has to be applied eccentrically, as it cannot be applied concentrically. CHARLES OGILVY.

JOACHIMSTHAL: THE EARLY DIAGNOSIS OF CONGENITAL DISLOCATION OF THE HIP. (*Versammlung Deutscher Naturforscher und Arzte im Köln,* September 20, 1908.)

Joachimsthal describes the following method of detecting congenital dislocation of the hip in young children before they have begun to walk, having himself recognized the condition and successfully reduced a number of cases during the first year of life. The child is placed on its back and both thighs abducted and flexed to 90°, both sides being at an equal angle. Corresponding to the concentric position of the head of the femur, the axis of the thigh of the normal side takes the normal course to the acetabulum. Apart from small cutaneous folds there is no demonstrable interruption of the fold of the groin. On the dislocated side a marked change in the direction of the femur axis is seen. Even in double-sided dislocation this is sufficiently marked to make the diagnosis clear. CHARLES OGILVY.

LOVETT, ROBERT W., AND LUCAS, W. P.: INFANTILE PARALYSIS. (*Journal of American Medical Association,* November 14, 1908.)

A study of 635 cases, with special reference to treatment. The paper deals with an analysis of 635 consecutive, unselected cases of infantile paralysis seen at the orthopedic out-patient department of the Children's Hospital, Boston.

From an anatomical study of the spinal cord these conclusions are deduced: That, on the whole, the groups of motor cells run in the length of the cord and have their association in this direction, and that the blood supply is mainly horizontal. Hence, unless the lesion is very extensive, some cells in a group are likely to escape destruction. The utilization of such remaining cells in partly destroyed groups becomes therefore one of the most important objects of treatment. The etiology is discussed at length.

The disease, the authors state, is generally believed to be of infectious origin, but direct bacteriological proof is, as yet, absent. After considering the different forms of treatment, the following are the conclusions:—

Infantile paralysis is a less formidable affection than is generally believed; partial paralysis is common; disused and stretched muscles appear to be paralyzed, but possess a possibility of function.

In addition to mechanical treatment an attempt should be made by massage, electricity, and especially by muscle-training to wake to activity the remaining cells in partly destroyed groups and thus to secure muscles which perform their function. After tendon transfer the development by muscle training of the transferred tendons is essential to good results, and without this the percentage of failures will be large. CHARLES OGILVY.

MEDICINE.

PESTALOZZA, F.: FECAL INCONTINENCE. (*La Pediatria*, January, 1909, p. 51.)

Pestalozza thinks it strange that while enuresis is continually discussed so little attention is given to fecal incontinence. This is frequently found accompanying enuresis. Three cases which might be considered typical have recently come under his observation. One, a boy of eight, had for several weeks involuntary movements of the bowel every night. Intestinal parasites finally appeared and their removal prevented further recurrence. The other 2 cases were nervous, anemic children. There was apparently no cause for involuntary defecation. Tonics and intestinal antiseptics effected a cure in a few months. The author

asserts that the mechanism of fecal incontinence is identical with that of enuresis.
C. D. MARTINETTI, M.D.

TULEY, H. E.: HEMORRHAGIC DISEASES OF THE NEWBORN. (*Journal of the American Medical Association,* December 26, 1908, p. 2,215.)

Tuley says the newborn are prone to develop hemorrhages. The general consensus of opinion is that the causative factor is a general septic infection—the portals of infection being the umbilicus, the gastrointestinal tract and the genito-urinary tract. Hemorrhages may occur from any organ. He reports one case of gastrointestinal origin and gives his treatment, which was a gelatin solution 20 c.c., being given subcutaneously.

G. R. PISEK.

TIRARD, NESTOR: THE RENAL COMPLICATIONS OF SCARLET FEVER AND DIPHTHERIA. (*The Practitioner,* January, 1909, p. 18.)

In scarlet fever the renal complications vary from a slight and transient albuminuria to an acute nephritis with severe symptoms of uremia or with more or less dropsy. "Febrile albuminuria" usually disappears as the temperature falls, but the albuminuria of scarlet fever appears to be of toxic origin and is discovered at a later stage than the foregoing. Traces of albuminuria generally yield to careful dieting and treatment, but it is important to prevent the condition developing into an acute nephritis. Systematic examinations of the urine should always be made during the whole course of the disease and convalescence, because many cases show no outward signs of disturbance of the kidney.

As regards predisposing causes, the transient type of albuminuria has been thought to be relatively more frequent in patients suffering from adenitis. There seems also to be a family predisposition to kidney complications, and damp, cold days have been found to increase the number of cases of albuminuria in the fever hospitals. Acute scarlatinal nephritis does not appear to depend upon the severity of the original symptoms, and, in fact, in many instances, it would appear more apt to arise after a mild initial fever. Convulsive seizures may be the first indication of renal involvement, or, in some cases, there may be sudden suppression of the urine followed by general edema and extreme pallor. The edema of acute scarlatinal nephritis is generally of short duration under proper treatment; but, unfortunately, it may cause the formidable complication of edema of the glottis. Occasionally edema occurs following scarlet fever when no albumin can be found in the urine.

In diphtheria albuminuria is relatively more frequent than in scarlet fever, but this does not give rise to distinct symptoms nor leave permanent renal trouble after recovery from the primary disease. Occasionally, however, complete suppression of urine occurs and death is preceded by vomiting and heart failure without general edema. LINNÆUS LA FÉTRA.

SCHIAVETTO, Q.: A STUDY OF MONGOLIAN SPOTS ON EUROPEAN CHILDREN. (*La Pediatria,* January, 1909, p. 42.)

The author gives a brief history of the study of Mongolian spots, which, according to statistics, are found in 89 per cent. of Asiatic children. They consist of bluish spots of varying size and shape symmetrically located on various parts of the body, most frequently on the buttocks. They are most evident in the newlyborn and fade with age. Hitherto, few cases of European children thus affected are recorded. In his dispensary work Schiavetto has come across two, which he describes. He does not consider these spots to be a sign of degeneration nor a racial characteristic, but simply a teratological curiosity.

C. D. MARTINETTI, M.D.

SCHWARZ, HERMAN: ANGIONEUROTIC AND SOME OTHER EXAMPLES OF ESSENTIAL EDEMA IN CHILDREN. (*American Journal of Obstetrics and Diseases of Women and Children,* October, 1908, p. 706.)

Schwarz reviews the prevailing theories as to the physiologic and pathologic factors which enter into the formation of both local and general edema. He says that angioneurotic edemas are probably due to active vasodilatation, assisted by some potent factor causing obstruction or increased blood pressure. In the 5 cases cited, the first showed a general edema following scarlet fever without nephritic involvement. The second case also occurred in connection with scarlet fever without kidney involvement, but quinin had been used in the treatment; the edema here was confined to the feet. The third case showed edema of the genitals and extremities and followed an erysipelas. In the fourth case a general edema occurred following a gastroenteric attack, in the treatment of which excessive quantities of salt had been used. The fifth case was one of angioneurotic edema in different parts of the body, accompanied by abdominal pain and vomiting. After reviewing the literature he concludes: (1) that there is certainly a hereditary factor; (2) that toxins generated in the gastrointestinal tract, certain articles of diet, reflex nervous phenomena, exposure to cold and anxiety may be the exciting causes. G. R. PISEK.

BIAGINI, G.: RECURRENCE OF BRONCHOPNEUMONIA IN INFANCY. (*Rivista di Clin. Pediatrica, October,* 1908.)

The author gives as the result of his studies on the subject the following conclusions:—

(1) Statistics of bronchopneumonia in infancy show a lower mortality in cases of recurrence. This allows a more favorable prognosis in such cases.

(2) It is very probable that here, as in other affections, we have a real immunization caused by previous attacks.

C. D. MARTINETTI, M.D.

HYGIENE.

SACHS, T. B.: CHILDREN OF THE TUBERCULOUS. (*Journal of the American Medical Association,* October 24, 1908, p. 1,413.)

Sachs concludes that lack of hygiene, combined with enforced closeness of contact in the homes of the poor, facilitates the more widespread dissemination of the infecting agent.

To what extent the influence of hereditary predisposition is responsible for the development of the disease is not determinable. The incidence of origin in the vast majority of cases remains unrecognized. But few children of tuberculous parents present the well-known manifestations of a fully developed disease of the lungs or other organs. G. R. PISEK.

INFANT FEEDING.

PISEK, GODFREY R.: A PRESENTATION OF THE SUBJECT OF ARTIFICIAL INFANT FEEDING FOR THE GENERAL PRACTITIONER. (*The American Journal of Obstetrics and Diseases of Women and Children,* October, 1908, p. 694.)

Pisek says that proper tissue formation cannot take place if a sufficient quantity of proteids is not supplied; fats and carbohydrates furnish energy, but they are not tissue builders. A correct food for an infant is one which it can digest and one which contains sufficient of the different food elements to enable proper development to take place. Milk from mixed herds is to be preferred. A good milk will contain approximately 4 per cent. fat, 5 per cent. carbohydrates and 3.2 per cent. proteids. After the cream has risen the first 16 ounces from a quart bottle of milk will contain 8 per cent. fat, the percentage of proteids and carbohydrates being the same as in whole milk. The first 9 ounces contain 12 per cent. fat. By varying the number of ounces of top milk in any mixture, it is possible to obtain any percentage of fat or proteid, *e.g.,* the top 9 ounces contain: fat, 12 per cent.; carbohydrates, 5 per cent.; proteids, 3.2 per cent., and to obtain a 3 per cent. fat use one part of this top milk and three parts of diluent. The percentages will all be divided by four and the mixture will then contain: fat, 3 per cent.; carbohydrates, 1.25 per cent., and proteids, 0.8 per cent. Lactose must be added to all modified milks to bring up the percentage of carbohydrates. Cereals given as thin gruels are convenient mechanical diluents, and by their use the proteid compositions in a modified milk mixture can be increased. Dextrinizing the gruels before using them as diluents is often of use in the early months and in difficult cases. Mutton, chicken, veal and beef are available for broths. They should be well cooked and strained and the fat removed before using. Tables are appended with a suggestive scheme for feeding normal infants, for supplementary modifications of the food, for cases previously improperly fed, and for difficult feeding cases.

G. C. ALBEE, M.D.

BOOK REVIEWS.

Die Lordotische Albuminurie. By Dr. Ludwig Jehle, Assistant in the Children's Dispensary, Vienna, Pp. 114. Franz Deuticke, 1909.

In this monograph Jehle treats orthostatic albuminuria from a new point of view. He shows by means of clinical and animal experimentation that this form of albuminuria is brought about not by erect posture, but by the lordotic posture. Whether the child stands or lies in bed this pathological condition results if lordosis is maintained; in fact, in two-thirds of the normal children between ten and thirteen years of age the lordotic change of the urine could be brought about within a few minutes. The cases reported seem to verify the author's contention. It is surprising, however, to learn that not only albumin, but hyalin, granular and even epithelial casts result from this abnormal posture. Indeed, this idea is so foreign to our general conception that further corroboration seems necessary. The pathogenesis of this albuminuria is attributed to an increase of the natural stasis in the inferior vena cava by means of the mechanical obstruction of lordosis.

The etiology points to a new method of treatment. The abdominal muscles should be strengthened, all exercises causing lordosis should be prohibited, and a brace should be worn to prevent the patient assuming this abnormal position.

The pamphlet is well written, sufficiently illustrated, and the ideas well supported by convincing and ingenious experiment. It is certainly a decided contribution to the pathology of albuminuria in childhood.

A Manual of Diseases of Infants and Children. By John Ruhräh, M.D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Baltimore. Second Revised Edition. 12mo volume of 423 pages, fully illustrated. Flexible leather, $2 net. Philadelphia and London: W. B. Saunders Company, 1908.

This second edition of Dr. Ruhräh's Manual is one of the most useful books for students we have seen. The present work has sections added upon the medical inspection of school children and the duration of contagion after infectious diseases.

The difficult subject of Infant Feeding has had devoted to it much more space than is usual in such a manual. While the discussion of any particular topic must necessarily be short, Dr. Ruhräh manages to give concisely the best opinion of the present day in regard to his subject. The illustrations are numerous and especially good, and the book is of a convenient size.

THE THERAPEUTIC USE OF TUBERCULIN IN THE TUBERCULOSIS OF INFANTS AND CHILDREN. Schlossmann (*Deutsch. Med. Woch.*, February 18, 1909, No. 7), in an article illustrated with X-ray photographs and different kinds of charts, takes up at length the treatment of young patients with tuberculin. He reports several cases during the article. He considers that in children's tuberculosis, tuberculin has a specific healing power. First, a period of small doses should be gone over in order that the child may become tolerant to the tuberculin. Then larger doses should be given over a considerable length of time. During this stage the child is supposed to develop antibodies. Then big doses are given with a corresponding interval between. During the period of large doses he has not observed any harmful effects.—*Boston Medical and Surgical Journal.*

RUMINATION IN A GIRL AGED THREE YEARS. Dr. J. Comby (*Archiv. de Med. des Enf.*). The child, whose parents were neurotic but did not suffer from merycism, was born at full time, and enjoyed good health until the age of one year, when she contracted whooping-cough complicated with gastroenteritis. Later she suffered from constipation alternating with attacks of mucomembraneous colitis. It was only about three months prior to her coming under observation that she was first noticed to bring back her food into the mouth. This occurred invariably a few minutes after finishing a meal, and was unaccompanied by any effort or pain. The food, after further mastication, was swallowed again, and, in the case of dessert and dainties, with evident pleasure. She was encouraged by her mother to spit the food out, but this she refused to do. This rumination would last for about two hours, during which time there was emitted from her mouth a disagreeable sour odor. The child was constantly in a stage of hunger. Her general health was, however, good.—*Woman's Medical Journal.*

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JULY, 1909.

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ORIGINAL COMMUNICATIONS.

THE DIAGNOSIS OF TUBERCULOSIS IN YOUNG CHILDREN.*

BY HENRY L. K. SHAW, M.D.,

AND

ARTHUR T. LAIRD, M.D.,

Albany, N. Y.

Special care and training are required to diagnose tuberculosis in children. Only too frequently the disease gains a fatal headway before it is recognized. The diversity of the points of entry of the infection, the wide range of clinical symptoms, and the variety of pathologic changes add factors to the problem which render its solution most difficult.

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* Read at the Fifth Annual Meeting of the Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 14, 1909.

The frequency of tuberculosis in early life is the strongest possible argument of the importance of its early recognition. It is therefore not departing from the purpose of this paper to quote from the statistics of well-known authorities.

Albrecht, of Vienna, found evidence of tuberculosis in 1,060, or 33 per cent. of 3,213 autopsies in children under twelve years of age. The youngest case was a two-weeks-old baby. Under one year there were 1,300 autopsies with 191 cases of tuberculosis, or 16.6 per cent. Between the first and sixth year there were 1,558 autopsies with 691 cases of tuberculosis, or 44.3 per cent. Between the sixth and twelfth year there were 178, or 50.1 per cent. of 355 autopsies. Comby, of Paris, has just published his series of 1,447 autopsies in children, among whom tuberculosis was found in 536, or 36 per cent. Under one year there were 685 autopsies with 112, or 16 per cent. tuberculous. There were 327 autopsies between the ages of one and two, with 141 cases of tuberculosis, or 43 per cent. Over two years of age there were 435 autopsies with 283, or 65 per cent. tuberculous.

Wollstein reported a series of 1,137 autopsies at the Babies' Hospital, in New York, on children under four years of age. Of these, 185 showed tuberculosis. Under one year the percentage of tuberculous cases was 12 per cent., during the second year 33 per cent., and over two years 34 per cent.

From the above it appears that Schlossmann is justified in concluding that "it is by no means rare to find tuberculosis in children and the nearer we approach puberty the oftener it is met with. The clinician must look for tuberculosis in children of any age."

The modes of infection have a most important bearing on the diagnosis. Prenatal, congenital or hereditary tuberculosis is so rare that it can be disregarded. The question of transmission of the disposition is still undecided. The offspring of tuberculous parents show great susceptibility to infection and are apt to be poorly nourished, with low vitality. Comby argues that babies with malnutrition are found very often in families with no taint of tuberculosis and that the special susceptibility is due to constant contact with tuberculous individuals. Remove the baby from the tuberculous mother immediately after birth and he claims there will be no infection. He insists that neither tuberculosis nor its disposition are hereditary—children are not born with tuberculosis, they acquire it. Infection during life may take place through the air (inhalation infection) and from the food (alimentary or ingestion infection). The inhalation form is probably by far the most common route. Holt found involvement of the lymph nodes and lungs in 99 per cent. of his autopsies on cases of tuberculosis and Albrecht found about the same percentage. This may take place through the nasopharynx, tonsils, respiratory or alimentary tracts. Children are especially exposed to infection. There seems to be an irresistible impulse innate in the child to place everything in the mouth—toys, fingers, etc. In the home of a tuberculous adult the dangers to the child are enormous. Dust from a room inhabited by a consumptive has been found virulent for six weeks. Towels in a tuberculous household are fertile sources of infection. Cases of tuberculosis admitted in the New York Babies' Hospital show a history of tuberculosis in the family in nearly 50 per cent. of the cases.

Infection through the intestinal tract is minimized by some and magnified by others. Albrecht made a most careful search in his 3,213 autopsies and found primary intestinal infection in but six-tenths of 1 per cent. He denies the possibility so strongly urged by Behring, Ravenel and others, of the tubercle bacillus passing through the intestinal mucosa and mesenteric lymph nodes and infecting the lungs and bronchial lymph glands without leaving any trace in the intestine. Comby says he has never seen a case of primary intestinal tuberculosis.

There is a tendency to overrate the danger from the milk of tuberculous cattle. In a paper before this Society two years ago one of us (Shaw) stated that such cattle are a menace to public health and in rare instances have given the disease through their milk, and while efforts to stamp out the disease in cattle should be made, yet the attention of the public should not be diverted from the great and very real danger of human contagion. If tuberculous milk is as virulent as so many declare, it is difficult to conceive how any child escapes infection.

A diagnosis of tuberculosis in a child by rational symptoms alone is impossible in the early stages. Holt, as a result of his wide clinical experience, considers as probably tuberculous every infant who has been for any length of time in contact with a tuberculous parent or other tuberculous member of a household.

The history of tuberculosis in the family of a sick child is almost *a priori* evidence of the presence of some form of tuberculosis. Careful and tactful questioning is often necessary before the source of human contagion is established. Association of the child with tuberculous parents or other consumptives is a matter of such importance in the diagnosis as well as in the prevention of the disease that every member of a tuberculous family should be examined as a matter of routine.

In the diagnosis, therefore, the family and previous history is most valuable. Association of the child with tuberculous parents or other infected individuals is most significant. Other matters of importance to be noted in the anamnesis are the various predisposing causes of the disease. These include unhygienic surroundings, improper feeding, and the various children's diseases, especially measles and whooping-cough. Tuberculosis occurs more frequently in artificially-fed infants. This, however, is no indication that the infection is always of the bovine type and contracted from the use of milk of tuberculous cows. Bottle-fed babies have a greatly lessened resistance to any infection.

Hypertrophy of the lymphoid tissue of the nasopharynx undoubtedly lessens general resistance to all infections, but that such tissue often serves as a point of entry for tuberculous infection has not been proved. The studies of Nobecourt and Tixier are evidence against the view that adenoids and enlarged tonsils often stand in such relation to the disease. They are of importance in the diagnosis only in so far as they present conditions prejudicial to normal respiration.

The clinical form which the disease takes in early childhood depends on various factors. The mode of infection doubtless has some influence, though less than was formerly supposed. Trauma and the acute infectious diseases may develop foci of lessened resistance. The most common types of the disease in early childhood are *glandular tuberculosis* (adenopathy), *tuberculous meningitis, acute miliary tuberculosis, tuberculosis of the bones and joints,* and *pulmonary tuberculosis.*

It is not necessary to enter into a discussion of the relative frequency of these forms. It appears from the statistics of Albrecht, Holt, Adams and Woods Hutchinson that pulmonary tuberculosis is much more common in early childhood than is generally supposed.

Grancher's demonstration of the frequency of tuberculous tracheobronchial glands at autopsy has shown that this condition is not recognized in the majority of cases during life, and statistics show that tuberculous children dying from whatsoever cause have tuberculous glands in from 80 to 100 per cent. of the cases. The great dangers to the child are that the deposits in these glands may extend into the lung or adjacent organs or may ulcerate into a blood vessel and produce a general miliary tuberculosis. They produce no symptoms characteristic in themselves and their presence is rarely detected by the ordinary physical examination of the chest. The importance of diagnosing this bronchial gland tuberculosis has developed several special methods and alleged signs. Thirty years ago Eustace Smith described a sign which is still associated with his name. It consists of hearing a systolic murmur over the upper part of the sternum when the head is thrown back as far as possible. It is only of suggestive value. Grancher lays great stress on differences in the breath sounds at the two apices.

D'Espine attaches importance to the bronchophony and pectoriloquy posteriorly. He states that bronchophony normally ceases at the level of the seventh cervical vertebra, but when the bronchial glands are enlarged it may be extended downward to the fourth or fifth dorsal vertebra.

The use of the X-ray is now more generally employed in the diagnosis of diseases of the chest. If the glands are considerably enlarged their shadow can be detected; but in most cases nothing is to be made out. Hochsinger has pointed out that special care is needed in the interpretation of radioscopic plates, for the shadow of the heart in young children offers certain peculiarities on account of the proximity of the heart to the thymus gland and to the high position of the diaphragm.

The *temperature* has a very important diagnostic value in tuberculosis of adults, but its significance is not so great in infancy. Sachs found great variation in the temperature of 250 apparently healthy children. At St. Margaret's House, Albany, the temperature of 10 healthy infants under eight months of age was taken by rectum every two hours for four weeks. The average showed a minimum of 97.4° and a maximum of 100.2°. This does not take into consideration, however, the temperature in acute processes such as occur in tuberculous bronchopneumonia, meningitis, etc.

The studies on the *blood* of tuberculous patients at the Phipps Institute confirm the observation of foreign observers that the anemia of tuberculosis is of the chlorotic type—that is the hemoglobin is reduced disproportionately to the red cells. Hultgen examined the blood in 28 cases of incipient tuberculosis and in 28 cases of chlorosis and found a similar blood picture. One of the features is a lymphocytosis. In pulmonary tuberculosis Holt believes examination of the blood may give a useful hint. A low leukocyte count—under 10,000—is said to favor tuberculosis, but a high one—over 20,000—does not exclude it. The percentage of polymorphonuclear cells is, as a rule, higher in pneumonia than in tuberculous processes.

The *opsonic* index in the diagnosis of tuberculosis in young children is certainly not of more value than in adults, while the difficulty in carrying out the test is greatly increased. The "twelve honest" drops needed to secure a suitable leukocyte "cream" would with great difficulty be obtained at frequent intervals from a struggling infant. Dr. Mary Lincoln's studies show that the percentage of positive reactions obtained by the cutaneous and ophthalmic tuberculin tests was substantially the same as she obtained from the opsonic index. There are many difficulties in carrying out this method and there is a wide range of possible technical error. Baldwin, who has much experience with this method, concludes that the expectation of much practical use of the index in pulmonary tuberculosis in the usual method of its application is not well founded.

The examination of the *sputum* in young infants was considered impractical until Holt called attention to the ease with which the sputum can be obtained. He reported a series of 67 cases of pulmonary tuberculosis in children under two years of age. Fifteen of these were under six months of age. Tubercle bacilli were detected in over 80 per cent. of the cases, although the disease in most cases was not advanced, judging from the symptoms and physical signs.

It is well known that infants cough up the bronchial secretion into the pharynx and immediately swallow it. Hunting for tubercle bacilli in the stomach contents is a hopeless task. Holt's method is to excite a cough by irritating the pharynx with a small bit of muslin in the jaws of an artery clamp. The secretion is readily secured on the muslin when it is brought up by the cough. Muslin is to be preferred to gauze or absorbent cotton. Time and patience are required, for, in most cases, repeated examinations are necessary.

The use of *tuberculin* for diagnostic purposes dates back nearly twenty years, when Koch described the "tuberculin test." A slight amount of fever in the suspected patient is a contraindication to its use. The so-called *"stichreaktion,"* to be described later on, is a new interpretation of this test. In chronic lesions, especially of the lymphatic and osseous system, it has decided value and is to be recommended for diagnosis. The great majority of authors agree that no harm results after the injection.

The *cutaneous* tuberculin reaction was first described by von Pirquet in 1907. This consists of a skin vaccination with tuberculin carried out in a similar manner to that for vaccinia. This test has grown in favor and is widely employed. It is simple, easy of application and absolutely without danger or unpleasant effects. Its use is most applicable in children and its results are to be relied upon. As latent tuberculosis is rare in infants a positive reaction is a warning to be heeded.

Wolff-Eisner, of Berlin, inspired by von Pirquet, found, by instilling a drop of a weak solution of tuberculin on the conjunctival mucous membrane in tuberculous subjects, that there was a constant and specific reaction. This he called the *conjunctival* tuberculin reaction. Calmette, of Paris, about a month later, published a series of similar experiments with identical results, but undertaken independently. He employed the term *ophthalmic test.* This test was almost universally used at first, but lately it has become unpopular, as a number of instances of serious injury to the eye have been reported.

Moro, of Munich, recently found he could obtain a specific reaction on the skin of tuberculous individuals by the inunction of an ointment containing tuberculin. This he termed the *percutaneous* test. The chief advantage claimed is that it is less sensitive than the cutaneous test and does not react so often to latent tuberculosis. Monti compared the two tests in a series of 43 known cases of tuberculosis and found a reaction from the cutaneous test in 98 per cent. and from the percutaneous test in 88 per cent.

The ophthalmic test was used on 81 infants under twelve months of age at St. Margaret's House with no reaction, although one child subsequently died with acute miliary tuberculosis. On the same series of infants the cutaneous test gave one reaction. In the past four months the cutaneous test has been used on 72 infants under twelve months of age with two positive reactions. One of these is a four-months-old infant from a tuberculous household with positive physical signs. The other is apparently healthy, but the mother is tuberculous and now under treatment.

The cutaneous test was made on 330 children in three orphan asylums in Albany, with the following results:—

	Positive.	Negative.	Total.	Per cent.
Under two years ..	2	70	72	2.5
2 - 3 years	2	25	27	7
3 - 4 "	3	18	21	14
4 - 5 "	7	21	28	25
5 - 6 "	7	16	23	30
Over 6 years	72	87	159	45
	93	237	330	28

This is in accord with the published results of many investigations and shows the increase in latent tuberculosis as the child grows older.

Hamburger has very recently emphasized the diagnostic importance of what the Germans term the *"stichreaktion."* This is the local reaction at the point of entry of the hypodermic needle after the injection of a minute amount of tuberculin. Epstein first described the reaction and Escherich called attention to its diagnostic importance. The technic consists of injecting 1 mg. of Koch's old tuberculin subcutaneously. When positive there will be a slight redness after six to eight hours. The next day there will be more inflammation with some induration. This induration with brownish-red discoloration persists for five to six days. Hamburger applied this test to cases which did not react to the cutaneous test and found that it is more reliable. Both tests were made on 509 children. The cutaneous test was positive in 33 per cent. and the *"stichreaktion"* was positive in 53 per cent.

This *"stichreaktion"* should always be noticed in connection with the subcutaneous tuberculin test. This has been done for a number of years at the Adirondack Cottage Sanitarium where the phenomena occurring at the site of the injection have been noted.

Dermatologists have recognized for years the existence of small papules on the skin in cases of tuberculosis. Their histologic picture, the detection of tubercle bacilli, and experiments on animals prove their tuberculous origin. Boeck, in 1900, proposed to term these the exanthemata of tuberculosis.

Hamburger was the first to call the attention of pediatrists to the great importance of these papules in the diagnosis of tuberculosis in young children. He found them in nearly all his cases of tuberculosis in infants. These papules, or tuberculides, are frequently overlooked, as not more than two or three can be found on the entire body. They are small, slightly raised, round papules, red in color, but later on often turn brownish. The crest is covered with a scale which can easily be scraped off, leaving a small crater-like depression in the center. Removing this scab does not cause any bleeding and there is never any tendency to ulceration.

We wish here to strongly emphasize the importance of these *skin tuberculides* in the diagnosis of tuberculosis in infants. During the past winter at St. Margaret's House two babies died from acute miliary tuberculosis. In one there were three of these skin tuberculides and in the other about half a dozen. They were typical in every respect and a histologic examination by Dr. Wolback of the Bender Hygienic Laboratory revealed numerous tubercle bacilli among the epithelial cells. There is now under observation at St. Margaret's an infant four months old, admitted May 7th with a severe bronchitis. The mother is tuberculous. There are several skin tuberculides, one on each thigh, three on the chest and one on the right shoulder. They have the characteristic scab and central depression when it is removed. The skin tuberculin test gave a very marked positive reaction.

Leiner, in his article in Pfaundler and Schlossmann's Diseases of Children, says: "The finding of any one or more of these (tuberculides) would show us the existence of a latent tuberculosis and put us on our guard and suggest therapeutic measures which used thus early would save life by preventing the spread of the tuberculous process."

Kelynack states truly that tuberculosis exacts a heavy toll from infancy and childhood. Infection most frequently takes place at this period and a campaign against tuberculosis is only waged with success if we can prevent its occurrence during childhood. The action of this Association in devoting a special section to the consideration of tuberculosis in children shows that its importance is recognized. Let us then make every effort, both as an Association and as individuals, to prevent and arrest the spread of tuberculosis in early childhood.

THE RELATION OF THE INFECTIOUS DISEASES—MEASLES, WHOOPING-COUGH AND INFLUENZA—TO TUBERCULOSIS IN CHILDHOOD.*

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Were tuberculosis but an occasional concomitant of these infections their widespread prevalence would alone warrant a careful consideration. The public, at least, has long entertained a fallacious idea with respect to these common diseases of childhood. Indeed, measles and whooping-cough have been, and continue to be, popularly regarded as conditions trivial in nature, something for the child to have and have done with. The dangers of such consideration cannot be overestimated. Dr. Newton Pitt, in a recent issue of *The Guy's Hospital Gazette,* has characterized measles and whooping-cough as the most important factors in the mortality of early life. Influenza, no doubt because of its apparent low mortality, as compared with its incidence, has been looked upon with all but indifference.

It is not, however, my purpose to discuss these diseases and the host of complications that contribute to such frightful mortality as is observed, but rather to point out, and more particularly emphasize, the relationship existing between these infections on the one hand, and tuberculosis in all its protean manifestations on the other.

Tuberculosis is observed to follow upon measles, whooping-cough and influenza, both in the rôle of complication and sequela, but in just what proportion of cases is difficult to determine. While I hope to show that this tuberculosis is, for the most part, dependent upon a pre-existing latent focus, the possibility of infection from direct exposure at the time is conceded.

Some idea of the frequency with which these diseases are associated may be gathered from the figures of Ganghofner in Prague. In 176 autopsies on children dying from measles, 55, or 31.2 per cent., were tuberculous. Heller, of Kiel, in 714 dead of infectious disease, found 140, or 19.6 per cent., tuberculous; Councilman, of Boston, in 220 found 35, or 16 per cent., tuberculous; Baginsky, of Berlin, in 806 found 144, or 17.8 per cent., tuberculous; Ganghofner himself, of Prague, in 973 cases found 253, or 28 per cent., tuberculous. These figures represent the definite presence of tuberculous conditions in association with the acute infectious diseases, and especially with measles, but do not inform us as to what relation existed. No doubt in a large proportion of cases death resulted from some cause only distantly related to the tuberculosis. If tuberculosis followed the infectious diseases in all cases in which there existed a latent focus of tubercle not many could escape. For instance, in a recent epidemic of measles in the Washington Orphan Asylum, where the children average seven years, there was not, in 75 cases, a single case complicated with tuberculosis. Nor has tuberculosis manifested itself in any of the patients up to the present time, an interval of two years. Certainly some of these children must be potentially tuberculous. On the other hand, no figures available can convey an adequate idea of the large number of cases in which the development of the tuberculous conditions is so long delayed as to obscure the rôle of previous disease in its etiology. The average length of time elapsing between the infection and the development of manifest lesions has been variously estimated as from a few months to years.

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* Read before Section Four, International Congress on Tuberculosis, September, 1908.

The difficulties met with in an attempt to investigate this subject are manifold. The records of hospitals receiving measles and whooping-cough do not deal with the sequelæ of these diseases; few postmortem examinations are had in such institutions (in this country), and the previous history of tuberculous patients is rendered unreliable from the very nature of the disease. To illustrate this last point, a case has just come to autopsy in the Children's Hospital, where the child, a colored one of ten years, giving a history of measles and whooping-cough two years ago, with good recovery, showed upon examination general miliary tuberculosis. This history, while suggestive, gives no definite information. Landis, of Philadelphia, in a recent investigation of a series of cases of measles, states that but little information was gained in this study as to the relation existing between tuberculosis and measles.

It seems important at this point to emphasize the prevalence of latent tuberculosis in children. According to Burton Fanning, it is stated, that a more careful examination of the offspring of tuberculous women and cows reveals tubercle in a larger proportion than was formerly supposed. While not common under three months the number affected progressively increases, until, at the age of one year, 7 to 8 per cent. at autopsy are found involved.

Kelynack states that 40 per cent. of all children under fifteen years of age show evidence of tuberculosis. Certainly those of us working at the local Hospital for Children are impressed with the number of cases of tuberculosis coming to autopsy, though the peculiar susceptibility of the negro race must enter into all local considerations. This latent tuberculosis, where the balance of power between the invader and the internal resistance is not maintained, is often evidenced by what Goodhart terms " . . . a tribe of glandular and other affections, ophthalmia, discharges from the ears, suppurating glands in the neck, and caseating mediastinal glands," and, furthermore, there is, what can best be expressed by quoting Kelynack, "An immense amount of impairment of health, crippling and lowering of powers to resist morbid influences, resulting directly from tuberculosis, without producing a mortality that can be statistically expressed."

In considering the relation existing between the acute infections, measles, whooping-cough and influenza and tuberculosis, we are unfortunate in not having more definite knowledge with respect to the exciting causes of at least two of these conditions. We can, however, observe certain clinical and pathological phenomena common to all.

They are alike characterized by a highly infectious nature; by a tendency to occur epidemically; by marked catarrhal inflammation of the mucous membranes of the entire body; and by greatly lowered powers to resist secondary invaders. This catarrhal condition constitutes a part of these diseases and is not to be confused with the processes observed to follow upon infection with the streptococcus, pneumococcus, etc. The most marked hyperemia and lymphatic activity is observed to accompany these changes in the mucous membranes.

In this catarrhal condition of the respiratory mucous membrane we have, I believe, the key to whatever connection exists between tuberculosis and these diseases. Not, however, in the sense that such inflammation predisposes to infection, but rather that it promotes the activity of quiescent disease. In discussing the etiology of tuberculosis, Fowler says: "Having regard to the extreme prevalence of catarrhal affections of the bronchi and the relatively small number of cases in which tuberculosis follows, I am disposed to think that the importance of this factor has been exaggerated."

The assumption that catarrhal affections of the respiratory passages heightens the susceptibility to tuberculous invasion is, of course, based upon the inhalation theory of infection. With respect to children it would certainly seem true that in the light of a constantly growing mass of evidence the importance of the inhalation theory has proportionately decreased. Von Behring, Calmette, Guerin, Delearde and others in Europe and Schroeder and Cotton of the United States Department of Agriculture have shown experimentally in animals, and clinically in children, the greater importance of ingestion. They have pointed out all but conclusively that our ideas of what constituted the evidence of the intestinal origin of the disease were entirely at fault. Mesenteric lymph nodes have been shown to contain tubercle bacilli, even in the absence of detectable lesions, and the thoracic lymph nodes have been shown to be the primary points of manifest lesion, irrespective of the site of infection or inoculation. Coupled with these facts comes the knowledge of the all but negative potency of the tubercle bacilli in dried sputum.

I have called attention to the lymphatic activity and hyperemia associated with these infections under discussion. Having in mind the prevalence of latent tuberculosis, we can picture the mechanism of the production of active disease. The lymph streams draining the inflamed areas, swollen to many times their normal volume, flowing through these foci of potential mischief, set free and carry into the circulation tubercle bacilli for distribution over the entire body. The resulting condition depends, first, upon the amount and virulence of the infectious agent; secondly, upon the relative resistance of the tissues to which it is conveyed. Most commonly, in children, is observed a general miliary disease, according to Nothnagel, with terminal meningitis. The results of our postmortem work at the Children's Hospital lead us to the same conclusions, except with respect to the terminal event. In 284 cases, 151 showed predominating pulmonary changes, whereas but 46 had meningeal lesions in excess. Albutt calls attention to the so-called subacute or chronic pneumonias of measles as being tuberculous. Undoubtedly the cases of bronchopneumonia, upon which tuberculosis is presumed to have become engrafted, are in reality miliary tuberculosis from the beginning. When the osseous system becomes the *locus minoris resistentiae,* the lesions are delayed months and perhaps years, when the symptoms characteristic of such conditions manifest themselves. Numerous cases of lupus following measles have been reported and in almost all instances have been traced to latent disease.

The rôle of latent tubercle is nowhere more strikingly shown than in institutions for children, where the incidence of tuberculosis after the acute infections is high. Under such conditions the opportunities for infection obviously do not exist. Dr. Northrup, discussing measles in this connection, says: "There remains, now that diphtheria is removed from the list, but one scourge in institutions for children, a plague, and that plague is measles." Of course the incidence of tuberculosis is not represented by the mortality, but other than the definite cases observed contribute largely, no doubt, to such mortality. Henoch regards the debilitated child the source of danger in measles; he fears the child more than the disease.

Whooping-cough and influenza occupy the same position relatively as measles. The frequency with which whooping-cough complicates measles adds, of course, a double danger. The extreme grade of inanition, so often observed in whooping-cough, no doubt goes largely, by producing a lowered resistance, to favor the development of disseminated tubercle.

Influenza, while giving rise to the most perplexing and alarming pulmonary phenomena, is seldom, if ever, followed by tuberculosis where such condition did not previously exist. Whilst mortality tables show a high death rate from tuberculosis during epidemics of influenza they represent an increased mortality rather than an increased morbidity.

Galbraith, in investigating the frequency with which persons in the pretuberculous state are affected, found in 150 consecutive cases 51 per cent. of cases infected with the Pfeiffer bacillus, and characterized influenza as one of the causes that permits the spread of tuberculous mischief. No doubt, as Burton Fanning said, it is extremely common to call influenza what is in reality nothing more than the fever and constitutional disturbance of commencing tuberculosis. The tuberculous lung offers a most favorable medium for the persistent growth of the influenza bacillus, giving rise oftentimes to the conditions referred to as "chronic grippe."

In the light of our present knowledge the conclusions justified would seem as follows: That taking into consideration the enormous morbidity of measles, whooping-cough and influenza, the incidence of tuberculosis as a complication or sequela is of relatively small importance; that its development is all but invariably dependent upon the pre-existence of a latent focus of infection; and that its dissemination is directly due to the lymphatic activity accompanying the pulmonary inflammation so constantly associated with these diseases.

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SYPHILIS THERAPY IN CHILDREN.—A. Eysell (*Münch. Mediz. Wochenschr.*, 1908, No. 24) treats the coryza, in children suffering from hereditary lues, by blowing 100 mgr. of a mixture of equal parts of calomel and sacchrum lactis into each nasal cavity. The symptoms disappear in a few days, while also the general condition improves greatly by continuing this treatment. The same good results were obtained in adults with mucous patches or ulcers in the nose or on the tonsils. In children older than ten years 0.1 to 0.3 calomel, mixed with 0.05 to 0.15 sacchrum lactis, was used three times daily. Deep inhalation brings part of the powder into the iarynx and trachea. Luetic lesions in other parts of the system also disappeared under this treatment.—*Interstate Medical Journal.*

THE SOY BEAN IN INFANT FEEDING. PRELIMINARY REPORT.*

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The soy bean (glycine hispida), sometimes incorrectly called the soja bean, is an annual leguminous plant which originally grew in a wild state from Cochin China to the south of Japan and to Java.

From the very earliest time it has been cultivated, especially in Japan and also in China, and it is supposed to have been used for food in China long before the time of Confucius. Although it has been used very extensively in China and Japan it has been very slow in spreading to other lands, possibly owing to the more or less complete isolation of these countries, until a very few years ago. It gradually found its way into India and was brought to Europe something over one hundred years ago, where it was grown in the botanic gardens as a curiosity. In England it was introduced about 1790, but no studies were made of its value from an economic standpoint. In 1875 Professor Haberlandt began a series of investigations with this plant in Austro-Hungary, and in his work published in 1878 he urges the importance of the soy bean as a food both for man and animals. After his death, which occurred in 1878, very little notice was taken of the soy bean in Hungary and the prophecy that he made for its future failed.

The soy bean has been known in the United States for many years. As early as 1829 Thomas Nuttall wrote an article in the *New England Farmer* concerning the bean as a valuable crop for this country. The Perry expedition to Japan in 1853 also brought back soy beans, but until the last fifteen or twenty years the plant was known only as a curiosity.

Recently studies have been made by the various agricultural experiment stations, most notably by those of Kansas and Massachusetts, and since 1898 the Office of Seed and Plant Introduction of the United States Department of Agriculture has taken up the work of distributing the bean. Some private seedsmen have also recognized the value of this crop and there are a few places where the seeds may now be bought.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 28, 1909.

The plant is grown in America, but is used chiefly for the purpose of a forage crop and comparatively little reference has been made to its use as food for man. The plant itself is an erect annual with branching stems covered with short hairs. The leaves are trifoliate and also more or less hairy. The flowers are violet or pale lilac in color and are small. The pods contain from two to five seeds and like the stems are covered with stiff, reddish hairs. The different varieties of the bean vary in size, shape, color and in the length of time they take to mature. Some are whitish, some yellow, some are greenish yellow, some brown and some black. In shape some are spherical and some more or less compressed. The plants reach the height of from two to four feet. They bear a remarkable number of beans and the flowers are self-pollinated, making the yield independent of insects.

The bean may be easily grown in Maryland. I am indebted to three friends for experimenting with this plant in their gardens and obtaining good crops. The plant grows best in about the same temperature as corn and when grown for food should probably be handled in the same manner as ordinary field beans.

The varieties differ in the length of time they take to mature. In the south the variety taking a long time to ripen may be grown, and only the more rapid varieties should be attempted in the north. At the present time there are seven varieties handled by seedsmen, and some twenty-two distinct varieties are known. In China and Japan almost every village has its own strain of soy beans. The varieties vary in size, as to the amount of foliage and number of beans produced. In the south the mammoth yellow is much grown, and it yields a large crop of hay and a fair number of medium-sized beans. It may be grown to advantage in poor soil, but it takes a long time to develop. The beans from this variety have been used in infant feeding experiments as well as the next two varieties, the Hollybrook and the Ito San. Both of these may be easily grown in Maryland and further north, and the crop of beans from both is very satisfactory. The other varieties are the Guelph (green), the Samarrow (green), the Ogemaw (brown), and the Buckshot (black). All of these latter may be grown in the north.

The plant assimilates free nitrogen from the atmosphere, and under favorable circumstances develops nodules on the roots like many other legumes, and this is facilitated by either inoculating the beans or the ground with the bacteria which causes nodules. The bean is best sown in drills and the rows should be wide apart, as otherwise the leaves will form such a dense shade as to interfere with the ripening of the beans. They should be harvested early, as the pods open spontaneously and if allowed to stay on the plants will scatter the beans on the ground. Ripening occurs in the ordinary varieties in from 75 to 90 days. The beans in the pods should be allowed to dry, care being taken to prevent moulding, and they should be carefully protected from rats and mice. As soon as the pods are dry the beans may be easily thrashed out. A full account of the plant will be found in the *Farmer's Bulletin,* No. 58, of the United States Department of Agriculture, and of the different varieties in the *Plant Industry Bulletin,* No. 98. I am indebted to Mr. Frank N. Meyer, agricultural explorer for the Department, for information concerning the use of the beans in the East.

The soy bean has been used to improve the quality of the soil and for silage and also as a hay crop. The beans have been used to feed animals, more especially cows and pigs. They are extensively used for food in the East and I am informed that at almost every meal in Japan and some parts of China the beans are served in some way. Some varieties are grown exclusively for the oil they contain and it is used for culinary, illuminating and lubricating purposes, the residue left after the oil has been expressed being used for fertilizer and also as food for animals. The light-colored beans are eaten in soups and the pods are sometimes picked green, boiled and served cold with a sprinkling of soy sauce. The green varieties are often pickled in brine and eaten moist or dried with meals as promoters of appetite; the same varieties are often slightly sprouted, scalded and served with meals in the winter time as a green vegetable. The bean forms the basis of the so-called soy sauces used as condiments all over the world. It is most frequently eaten in the more or less cheesy-like foods which are prepared from it. The most common of these are natto, tofu, miso, yuba and shoyu. Natto is a sort of bean cheese made by boiling the beans until they become very soft and then placing the resulting mass in a warm cellar, where it ferments. Tofu is prepared by soaking the beans for about twelve hours in water and then crushing them between mill-stones. They are then boiled in about three times the bulk of water and filtered. The filtrate is a white, opaque, milky liquid with a taste similar to malt. This soy bean milk has a composition nearly the same as that of cow's milk:—

Water	92.53	per cent.
Protein	3.02	" "
Fat	2.13	" "
Fiber	0.03	" "
Ash	0.41	" "
Nitrogen free extract, including carbohydrate	1.88	" "

In making tofu the protein is precipitated by adding the mother liquid obtained in the manufacture of salt from sea water. The precipitate is filtered off and made into cakes. The large amount of nitrogen which these beans contain probably accounts for the small amount of meat and other animal food taken by the Japanese. According to the dietary studies made in Japan the nitrogen from the beans, especially if taken in a mixed dietary, is easily absorbed. The soy beans are sometimes roasted and then used as a substitute for coffee. They are also sometimes served as a vegetable, first soaking the beans until the skins come off and then boiling them until soft and serving hot.

The bean cheese is apparently not very well suited to the palates of people except those in the Orient. I do not think the beans will gain much favor as food-stuff for man in America until further studies have been made in preparing them for the table. I have eaten them in a number of different ways and think that the taste for them would have to be acquired.

The North Carolina Experiment Station recommends the bean as a palatable vegetable and suggests that the beans be soaked until the skins come off and that they be stirred until the skins rise to the surface, when it is easy to remove them. The beans are then boiled with bacon until soft, seasoned with pepper, salt and butter and served hot. If the beans are green the preliminary soaking may be omitted.

The fact that the soy beans contain little or no starch suggested to Dujardin-Beaumetz that they be used for food for diabetics. The soy bean flour has been placed on the American market, but was withdrawn owing to the fact that according to the manufacturers it contained 8 per cent. carbohydrate. It contains much less carbohydrate, however, than any of the other diabetic foods.

The soy bean meals have been analyzed by Winton and two specimens showed the following composition: One is said to contain 5.5 per cent. of starch and the other 7.63 per cent. Both specimens have essentially the same composition, showing 39.87 per cent. protein, 3.85 per cent. of fiber, 2.09 per cent. of nitrogen free extract, 19.06 per cent. of fat, 8.95 per cent. of starch, sugar and dextrin, which is determined by the diastase method without previous washing with water and is calculated as starch and 7.75 per cent. water.

There are variations in the composition of the different varieties of beans. The yellow beans grown in America have the following composition:—

Water	10.13	per cent.
Protein	34.63	" "
Fat	17.98	" "
Nitrogen free extract	30.50	" "
Fiber	3.69	" "
Ash	3.07	" "

Calculated to a water free basis:—

Protein	38.50	per cent.
Fat	20.	" "

As regards the use of the beans in infant feeding it seemed to me that soy bean gruel or milk, either alone or mixed with cow's milk, might be of value in feeding several classes of cases, viz., of marasmus and malnutrition, as a substitute for milk in diarrhea, and in intestinal and stomach disorders, and in diabetes mellitus.

There is, of course, but one way to determine the value of a new food and that is by careful experimenting. I had hoped to be able to make a more complete clinical report at this time, but several misfortunes have attended my efforts to secure the beans. My first crop was eaten by rats, my second moulded in the pods owing to some unusually damp weather, and insects ate about two-thirds of my last crop. Fortunately, the beans may now be obtained from Messrs. T. W. Wood & Son, Richmond, Va.

So far the gruel has been prepared by soaking the beans over night, stirring to remove the envelope surrounding the bean. Three times the amount of water is added to the beans and they are boiled until a smooth gruel results. This is strained if necessary. This has the odor and taste of malt, but with the addition of a little salt is well taken, especially after the first bottle or two. The gruel is retained unusually well and seems to be easily digested. The stools are not more frequent than with other foods. The stools are light brown in color like those from malted milk. This soy bean gruel has nearly the same food value as milk and for certain children may need further dilution. About the same size feedings should be used as if milk were being given. Five per cent. sugar may be added to increase the fuel value.

I have not used the beans in a sufficiently large number of cases nor over sufficient periods of time to justify any further statements at this time, but I feel that properly used they will be a most valuable addition to the dietary of the sick infant. Grinding them to a bean meal would simplify matters very much, and, if success attends their use, a soy bean meal could easily be prepared.

I hope to be able to make a second report at the next meeting and have called your attention to the bean in the hope that other members may try them and report at the same time.

ECZEMA SEBORRHEICA AND FAT DIARRHEA. (*Mitteilung, der Ges. für Inn. Med. und Kinderhk., im Wien,* January 16, 1908.) A three-months-old child, with a very diffuse seborrheic eczema and a fat diarrhea, was treated with buttermilk, and the cutaneous lesions disappeared in a few days. The child had been nursed from birth, at first by its mother, later by a wet nurse, and from the beginning had had thin, watery stools, containing fat fragments. It had gradually developed an oily seborrheic eruption all over the body. Fatty applications applied to the skin aggravated the condition. Even after the eruption had entirely disappeared vaselin and fatty ointments were borne very badly by the skin. The occurrence of the marked fat diarrhea coming on so soon after birth, without any pathologic basis, leads one to the conclusion that the case was one of congenital fat intolerance, and that the normal fat secretion of the skin produced of itself an inflammatory reaction. Escherich emphasizes the importance of fat-free diet in the seborrheic cases.—*Woman's Medical Journal.*

CLINICAL MEMORANDA.

TUBERCULOUS ENTERITIS WITH FOREIGN BODY IN THE ILEUM, PROBABLE PRIMARY INTESTINAL TUBERCULOSIS.*

BY J. C. GITTINGS, M.D.,

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The decision as to the importance of the "intestinal route" of tuberculous infections is still far from a satisfactory solution. None but the most systematic and extensive work will decide it, especially, as Shaw points out, in relation to the differential bacteriologic diagnosis in all suspicious cases, not only of intestinal tuberculosis, but also of tuberculous affection of the tonsils, lungs and bronchial glands.

That the tubercle bacillus may reach the latter by way of the mesenteric glands and thoracic duct has been demonstrated experimentally in animals. Indeed, some authorities go so far as to consider that peribronchial tuberculosis without severe lesions in the parenchyma of the lung is an instance of infection which has taken place through the intestinal wall. The weight of evidence, however, both laboratory and clinical, is against the probability of the frequency of such intestinal infections.

The reverse of this would seem to be probable when we consider the large number of instances in which municipal milk supplies have shown a high percentage of contaminations with a tubercle bacillus virulent for guinea pigs. To state but a fraction of the accumulated evidence on this point: Anderson (*Journal of Infectious Disease,* March, 1908) found that 11 per cent. of 102 dairies in Washington served such milk.

The Wisconsin Experiment Station found that 35 per cent. of suspected herds and 9 per cent. of unsuspected herds were tuberculous. Ravenel (*Journal of American Medical Association,* October 12, 1907) found 18.7 per cent. of positive guinea-pig inoculations with milk from cows which showed no physical signs of tuberculosis, but which reacted to tuberculin and, later, proved to be tuberculous at autopsy. Adami (*Ibid*) found tubercle bacilli in the milk of 60 per cent. of tuberculous cows which showed no lesions of the lacteal tract.

Considering the widespread use of raw milk in infant feeding

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* Read before the Philadelphia Pediatric Society, June, 1908.

—to say nothing of adults—the wonder grows that any cases remain for infection by inhalation. While the protective rôle played by the free HCl of the gastric juice is well established, yet we know that milk forms one of the poorest excitants of HCl secretion and that the appearance of the free acid in the gastric contents is the exception in younger infancy. Hemmeter suggests that as milk is largely an emulsion of fats and as the latter retard or prevent the secretion of HCl, that milk is most likely to prevent the secretion of the very substance which protects the organism.

It is therefore evident either that the bovine type of bacillus is of low virulence for the human race—or we must accept the position of Behring, who holds that intestinal infection during infancy accounts for much of the tuberculosis of later life, the organism remaining quiescent in whatever tissues it may have lodged; or we must believe, which seems more probable, that the bacillus in its journey through the gastrointestinal tract meets with many conditions unfavorable for its existence, and that the epithelial cells of the mucosa offer a vital resistance to its inclusion and, finally, its transmission to the lymphatic circulation.

While purely clinical evidence is usually insusceptible of proof, and therefore rarely warrants the attempt to employ it in the solution of such a problem as that of the determination of the primary source of tuberculous infection, yet the following case seems of sufficient clinical interest to be reported.

Case Report.—J. C. White, female, five years of age.

Family History.—One paternal aunt died of "pulmonary hemorrhage" four years ago, but the patient did not live in the same house and was not in close contact with her. Both parents are well, as are three other children, one older and two younger.

Previous History.—Full term baby born in normal labor. Bottle-fed from birth as follows: Condensed milk, one month; Mellin's Food with milk, four months; malted milk, seven months. During all of this time the stools showed more or less evidence of indigestion and the nutrition was poor. During the second and third year she received "table food" and milk furnished by two small dealers, one of them purporting to supply "one cow's milk." During the fourth year the milk was purchased from two of the largest dealers in Philadelphia, who, we are led to infer, routinely pasteurize their entire product.

The patient had rubeola at two and one-half years and parotitis at three and one-half years. During the third year she began to have attacks of abdominal pain and tenesmus with diarrhea, five to six stools a day, the attacks lasting two or three weeks and recurring four or five times a year. The tendency to loose stools was constant. For the past six months colicky abdominal pain without reference to the stool has been frequent and the stools have increased from four or five to twelve to fifteen a day. They are of watery consistency, containing mucus and, at times, bright-red blood. Other symptoms noted were anorexia, occasional vomiting, fever and slight sweating at night, with marked loss of weight and strength.

Examination on Admission to Children's Hospital of Drexel Home, November 4, 1907.—Extremely emaciated child, skin of lemon-yellow color without lesions. Lies in dorsal position with thighs and legs flexed. Pupils equal, widely dilated. There is no adenopathy. The heart presents a normal area of dullness; the first sound at the apex is short, sharp and clear. The lungs are negative. The abdomen is slightly distended. Attempts at palpation develop general rigidity, tenderness and a feeling of fullness, but no definite mass can be felt. The summit of the abdomen gives a dull tympanitic note on percussion, the flanks give a movable dullness. Rectal examination reveals nothing but increased intra-abdominal tension. There is no edema.

The only complaint was of colicky pain, especially in the right iliac fossa, and tenesmus before the bowel movements, which occurred at intervals of about one hour. The temperature ranged from 99° to 102°, pulse 124 to 156, respiration 24 to 44. The laboratory findings in the case were as follows:

Urine examinations negative, except for slight albuminuria.

Blood examination:—

Hemoglobin,		
November 5th		20 per cent.
November 20th		17 " "
Erythrocytes	2,050,000	
Color index	0.5	
Leukocytes	4,700	
Polymorphonuclear neutrophiles		53.3 per cent.
Polymorphonuclear eosinophiles		00.0 " "

Large mononuclear cells ...	12.0 per cent.
Small " " ...	30.0 " "
Transitional cells	4.6 " "

One megaloblast seen while counting 300 cells.

Examination of Stool.—Black, almost liquid. Numerous small white bodies resembling uncooked rice. No segments, parasites or ova. Considerable mucus. Occult blood test faintly positive.

On November 5th and again on November 8th a radiograph showed the shadow of a round object of regular outline about 2 cm. in diameter, which lay above and to the left of the anterior superior spine of the ileum on the right side. Careful questioning of patient and parents failed to elicit the history of swallowing any foreign body. The mother said that for six months the greatest intensity of the colicky pain had been referred to the right iliac fossa.

In order to eliminate the foreign body as a cause of the excessive diarrhea and tenesmus in a case which was apparently one of abdominal tuberculosis the patient was transferred to the service of Dr. Harry Deaver for operation.

Operation on November 10th by Dr. Deaver. Ether Anesthesia.—Through an incision in the right rectus the foreign body could be felt in the lower portion of the ileum, freely movable, and proved to be a pearl button, thickly incrusted with salt deposits. Through the incision in the ileum several oval, transverse, punched-out, typically tuberculous ulcers could be seen, and many others could be made out through the serous coat. Just below the incision in the ileum there was a stricture of large calibre which had prevented the escape of the button. The stricture occurred at the site of an ulcer, which was in the process of healing, with marked infiltration in the wall of the bowel. The child's condition prevented extensive exploration of the abdominal cavity, or removal of any of the mesenteric glands draining the lower ileum, which were uniformly enlarged, pinkish-red in color, but apparently not caseous. There was a small amount of clear peritoneal fluid free from fibrin and the visceral peritoneum was not congested except over the ulcers. No tubercles were seen.

The child reacted promptly; the wound healed without suppuration. The only noticeable effect of the removal of the foreign body was a decrease of about 50 per cent. in the number of the stools and a decided diminution in the colicky pain. The temperature, pulse and respiration ranges were higher; temperature from 98.2° to 104° F.; pulse from 132 to 160; respiration from 26 to 40.

The treatment consisted of fresh air; forced feeding, largely with peptonized milk; creosote in small doses; carbonate of guaiacol and bismuth subnitrate. At the end of fifteen days, as no definite hope of improvement could be promised, the parents insisted on taking her home. The further history of the case showed a steady progress toward the fatal termination in January, 1908. About five weeks before death a cough developed. Examination of the lungs at this time (at patient's house) showed harsh breathing throughout both lungs but no evidence of ulceration. Autopsy could not be obtained.

To Recapitulate.—A child not subjected to any ascertainable direct tuberculous infection shows evidences from birth of deficient ability to digest. During the second and third year of life the child is fed on raw milk of questionable purity. During the third year enteritis develops, and during the fourth year blood appears in the stool. It is probable that the button was swallowed during the fourth year, as the attacks of colic in the right iliac fossa, which greatly diminished after operation, were first noted six months before death. It is especially noteworthy that the button gave every evidence of a prolonged stay in the bowel and that it had been arrested by a stricture formed by a partially healed ulcer. The acute stage of the ulcer must have occurred at a much earlier date, so that we may assume the duration of intestinal tuberculosis to have been at least eight months to one year —possibly twice as long.

Finally, no distinct involvement of the lung could be demonstrated as late as five weeks before death, shortly after the time that a cough developed.

While the lesions of miliary tuberculosis of the lung or beginning local or general infiltration of the parenchyma can escape absolute identification antemortem, the lesions of at least six to eight months' duration cannot be readily overlooked in a careful examination and, as has been said, the onset of the intestinal infection must have occurred from eight to twelve months before death.

The failure to obtain an autopsy is greatly to be regretted, yet from clinical evidence alone the probabilities strongly favor the belief that the case instances a primary intestinal infection.

3942 Chestnut Street.

A CLINICAL STUDY OF FORTY CASES OF ANTERIOR POLIOMYELITIS OBSERVED IN NEW YORK CITY DURING THE EPIDEMIC OF 1907.

BY HENRY HEIMAN, M.D.,

New York City.

In accordance with the title of my paper I shall not enter into an elaborate general discussion of anterior poliomyelitis, but shall limit myself chiefly to an analysis of the cases observed at the Mt. Sinai Hospital in Dr. Koplik's service and in the out-door department of the hospital during the epidemic of 1907. However, even in a short paper like this a few historical facts, recounting the important advances that have been made in the knowledge of this disease since its first recognition, should not be amiss. The distinction of having been the first observer to give a clinical description of this disease belongs to Underwood. His lack of a proper appreciation of the true nature of this affection is, however, shown by the fact that he described it under the name of dental paralysis. J. Von Heine, in his great monograph on "The Paralytic Conditions of the Lower Extremities and their Treatment," which was published in 1840, was the first observer to recognize the spinal origin of poliomyelitis. The next advance in our knowledge was made by Duchenne in 1855. He studied carefully the electrical reaction in this disease, and confirmed J. Von Heine's views as to the spinal origin of the paralyses which constitute such an important element in the symptomatology of this affection. Although autopsies had previously been made by Cornil, Laborde and others, Prevost was the first to demonstrate the changes in the ganglion cells of the anterior horns. Since then the pathologic lesions in the cord and other parts of the nervous system have been studied by Charcot and Joffroy, Goldscheider, Rissler, Harbitz, Scheel and others.

The first large epidemic was observed at Stockholm, Sweden, by Medin, who gave an admirable description of the disease. Since then smaller and larger epidemics have been described by Bulow, Hansen, Harbitz, Looft and Leegard. The first important epidemic in the United States occurred in 1894, in the Otter Creek Valley, Vermont. The disease was first seen epidemically in New York City in 1899, and again in 1902. The 1907 epidemic is, therefore, the third.

The last mentioned epidemic was the severest that this country has ever experienced. Starr, in his recent article in the *Journal of the American Medical Association,* estimates that there have been over 2,000 cases since August, 1907.

The question of etiology has occupied the attention of observers for many decades. The occurrence of the disease in epidemics and in several members of one family, the febrile course and the leukocytosis, speak emphatically for its microbic origin. At present the view of the infectious nature of acute anterior poliomyelitis is held by numerous clinicians. Convincing scientific proof is, however, still wanting. In 1901, Looft and Dethloft found a diplococcus in the cerebrospinal fluid in 2 cases of poliomyelitis. The same organism was also found by Geirsvold in 11 cases. In these not only was the diplococcus present in the cerebrospinal fluid, but also in the throat. He succeeded in readily growing the organism on the ordinary media. Subcutaneous injections in white mice produced either rapid death preceded by paralyses of the lower limbs, or a paralysis at a later stage. Harbitz and Scheel also found the same diplococcus in the cerebrospinal fluid of 3 cases, but did not succeed in growing the organism. Most observers have been unable to confirm these results. In our cases no organisms could be demonstrated either in the cerebrospinal fluid or in the tissues of the brain and cord. It was to be hoped that with all the modern scientific resources at our command the opportunity presented by an extensive epidemic like the last one would help to clear up the most obscure point about this disease, namely, the etiology. So far, however, we have been sadly disappointed. While our observations have not led us to abandon the view that the disease is microbic in origin, they have given us very few additional facts in support of this hypothesis.

The present study is based on 40 cases of poliomyelitis observed from May to November, 1907, 11 of which were studied at the Mt. Sinai Hospital in Dr. Koplik's wards during my service, 21 at the Mt. Sinai Dispensary, and 8 in private practice.

The 2 most prominent features of the last epidemic, in my experience, have been the not infrequent onset of the disease, with symptoms of meningeal irritation and the occurrence of bulbar symptoms. A considerable number of cases began with vomiting, headache, irritability, pain in the neck and back, hyperesthesia and rigidity. These cases resembled so closely epidemic cerebrospinal meningitis that in the early period of the epidemic an erroneous diagnosis of meningitis was occasionally made. . . . The following is a typical case of this mode, 6 of which were seen in our service: S. T., eighteen months of age, began suddenly with high fever, repeated vomiting and retraction of the head and hyperesthesia of back and neck; paralysis of legs did not appear until five days after onset.

In 7 patients bulbar symptoms were present to a more or less marked degree. They presented one or more of the following symptoms: Dyspnea, stertorous breathing, bradycardia, cyanosis, strabismus, facial paralysis, tremor of the eyelids and tongue, inequality of the pupils, dysphagia, rigidity of the neck and twitching of the extremities. I have been able to distinguish three types of these so-called bulbar cases. In one type, bulbar symptoms alone were present. In a second type, the disease began with bulbar symptoms and subsequently paralysis of the extremities developed. In a third type, initial paralysis of the limbs was followed by bulbar symptoms. These types are undoubtedly dependent on the variable localization of the inflammation in different parts of the brain and cord. The purely bulbar cases have been classified under acute polioencephalitis, superior and inferior; those associated with spinal symptoms under acute polioencephalomyelitis. But it is unnecessary to multiply terms. It has recently been shown by Harbitz and Scheel that even in the mild cases of poliomyelitis some degree of inflammation is present in the medulla, pons and basal ganglia, so that, properly speaking, every case of poliomyelitis should be called polioencephalomyelitis. The term poliomyelitis, however, is too deeply rooted to be replaced by a somewhat unfamiliar name.

The following cases will illustrate these three types of bulbar involvement:—

BULBAR SYMPTOMS ALONE.—I. R., nine years old. Admitted August 30, 1907. Began four days ago with pain and redness of throat. There was slight headache and fever, and the appetite was lost. Vomited once or twice, not projectile in character. Headache persisted, likewise pain on both sides of the neck. No convulsions. For the last few days there has been slight dyspnea. This morning, at three o'clock, patient had a convulsion lasting about five minutes. The upper and lower extremities twitched violently and the eyes rolled upward. There was no twitching of the mouth. The attack was followed by cold perspiration. Soon after the child became hoarse, and swallowing was difficult. The dyspnea increased. There was no paralysis of the face or extremities.

Past History.—Last illness was an attack of diphtheria, three years ago, from which she recovered completely.

Family History.—Three other children are well.

Physical Examination.—Fairly well nourished. General condition fair. Slight dyspnea; no cyanosis. Hoarse, nasal voice. Responds intelligently to questions; mouth is filled with saliva. Pupils are equal and react to light and accommodation, not dilated. Slight weakness of the right external rectus. Patient prefers to keep right eye tightly closed. Distinct weakness of left side of face, and drooping of left corner of mouth. Slight rigidity of neck. Flexion of head produces pain. Distinct tremor of both hands, but no weakness of either upper or lower extremities. Knee-jerks are present. No Kernig or Babinski. Sensation unimpaired.

White blood cells, 23,000; polynuclears, 85 per cent.; small lymphocytes, 15 per cent.; large lymphocytes, 5 per cent.

Lumbar Puncture. — 10 c.c. clear fluid under very little pressure.

Cytology.—Many endothelial and mononuclear cells. Spreads negative. Cultures sterile. Albumin, faint trace. Sugar present.

Patient had ten attacks of cyanosis accompanied by vomiting of brownish-black fluid. Died during one of these attacks on day of admission. Autopsy. (To be given later.)

BULBAR SYMPTOMS FOLLOWED BY PARALYSIS.—I. S., one year old. Admitted August 26, 1907. Began suddenly yesterday at 4 A.M. with an attack of hoarseness and stridor. There was some fever, but no vomiting. During the day took nourishment fairly well. Since this morning swallowing seems to be difficult. The child is drowsy and does not recognize parents. Mother thinks that the child has not moved legs to-day. Bowels and urination O. K.

Past History.—No previous infectious diseases.

Family History.—Seven other children are well.

Physical Examination.—General condition fair. Fairly well nourished. Marked dyspnea and cyanosis. Petechiæ on feet. Pupils are equal, dilated, react sluggishly to light. No facial palsy or strabismus. All four extremities are paralyzed. Slight twitching of the fingers is present. All deep reflexes are lost. White blood cells, 18,000.

Lumbar Puncture.—Cerebrospinal fluid shows very many degenerated pus cells, but few mononuclears. Smears, negative. Cultures, sterile. Albumin, negative. Sugar, very faint trace is present. Child died on August 26th. Autopsy. (To be given later.)

PARALYSIS OF EXTREMITIES, FOLLOWED BY BULBAR SYMPTOMS.—A. F., eight years old. Admitted August 17, 1907. Began suddenly twelve days ago with fever and headache. No vomiting or convulsions. Yesterday morning father noticed that child was unable to use left hand; a few hours later the right hand became similarly affected. There was no involvement of the lower extremities. Bowels and urination normal.

Past History.—Measles in infancy. No other infectious diseases.

Family History.—Four other children are well.

Physical Examination. — General condition good. Well nourished. Not apathetic. Tongue dry and thickly coated. Throat, negative. Pupils equal, moderately dilated, react to light and accommodation. No facial palsy or strabismus. Slight conjunctival discharge. Heart: borders normal, action regular, 112. Lungs, abdomen, liver and spleen negative. Total paralysis of upper extremities. Patient is unable to sit up. The lower extremities are paralyzed, but toes can be moved. Knee-jerks are absent.

White blood cells, 5,000; hemoglobin, 85 per cent; polynuclears, 40 per cent.; small lymphocytes, 48 per cent.; large lymphocytes, 10 per cent.; eosinophiles, 2 per cent.

August 19th. Lumbar puncture performed and 4 c.c. of fluid withdrawn under pressure of 30 m.m.

August 20th. Marked coarse tremor of eyelids is present. No facial paralysis.

August 25th. Last night pulse fell to 66. This morning it is only 64, at times irregular. No dyspnea, dysphagia or cyanosis. The tongue does not show any deviation. The right pupil is smaller than the left; both are irregular. No facial palsy.

August 26th. Pulse continues slow.

August 27th. Pulse becoming normal.

September 15th. All bulbar symptoms have disappeared.

September 22d. The muscles of the right lower extremity have recovered their functions. The muscles of the left lower extremity are also slowly recovering from the paralysis. Both upper extremities are still completely paralyzed.

October 11th. Muscles of both upper arms show R. D. Right and left quadriceps extensors R. D. Right and left anterior tibials R. D. Right and left forearm muscles no R. D. Right and left leg muscles no R. D.

October 13th. The stools show blood and mucus. No ova or amebæ found.

October 25th. Stools contain blood. Amebæ found.

October 26th. Marked atrophy of all extremities is present.

November 17th. Amebæ coli still present in stool.

November 19th. White blood cells, 4,800; polynuclears, 54 per cent.; small lymphocytes, 13 per cent.; large lymphocytes, 20 per cent.; eosinophiles, 12 per cent.; mast cells, 1 per cent.

January 22d. General condition good. Is still unable to stand. Grip fair in both hands, but better on left side. Motion of right arm freer than that of left. The left foot is more freely used than the right.

This case is of unusual interest, not only on account of the character and course of the bulbar symptoms, but also on account of the unexplained presence of the amebæ coli and the eosinophilia. This patient has recently returned to the hospital on account of the reappearance of the dysentery. The present status shows the following: Paresis of upper extremities, more marked on right side, slight contracture of right hand. Bilateral atrophy more marked on right side. Walks without limp; moderate atrophy of both lower extremities, more marked on left side. Knee-jerk present on left side, absent on right side. No facial palsy or strabismus. Pulse regular, 100.

The following table shows the relative frequency of the occurrence of the disease at various ages in the cases observed by us:—

TABLE.

7 weeks	1 case
9 months	1 "
1 year	8 cases
15 months	1 case
18 "	5 cases
2 years	11 "
3 "	6 "
4 "	3 "

4½ "	1 case
6 "	1 "
8 "	1 "
9 "	1 "

The ages of the 7 bulbar cases were as follows:—

1 year
13 months
22 "
3 years, 9 months
6 "
8 "
9 "

The affection did not follow any particular infectious disease; in fact, most of the children attacked were previously in good health.

The onset of the disease was sudden in 34 of the 40 cases. Aside from the presence at the time of onset of symptoms of meningeal irritation, the symptomatology did not differ materially from that usually described in text-books. In a few cases, however, there was found a distinct history of sore throat one or two days previous to the appearance of the paralysis. Diarrhea was not a prominent symptom in any of our cases. The interval between the onset of the disease and the appearance of the characteristic paralyses was of variable duration. In some cases the paralyses appeared within a few hours. In a few cases there was a transitory paralysis of wide distribution. The most frequent localization of the paralyses were as follows:—

Both lower extremities	8 cases
Right lower	6 "
Both upper and lower	3 "
Both lower and right upper	2 "

Other localizations, of which there were many combinations, were represented by single cases. The partial retrogression of the widely distributed initial paralysis previously mentioned usually took place within a few days. The more lasting paralyses dependent on changes in the ganglion cells were of very variable duration. The result of a re-examination of the cases that returned will be given in a separate table.

In the 11 cases observed at the hospital, blood cultures were taken in 5 and lumbar puncture performed in 6 within three to fourteen days from the onset. All the blood cultures were negative. In the cerebrospinal fluid no organisms of any kind could be demonstrated in smears or cultures. In one fluid a differential count of the morphological elements present gave 30 per cent. polynuclear leukocytes. In one fluid there was only a faint sugar reaction. The remaining four fluids were normal. White blood counts were made in 9 cases. The minimum count was 5,000, the maximum 23,000, and the average 13,000. In 3 cases the urine showed a faint trace of albumin, but no casts or other renal elements.

Autopsies were performed on 3 cases, all of which were of the bulbar type.

Dr. I. Strauss, who has made a very careful study of the pathologic changes in these cases has kindly furnished me with the following data, for which I take this opportunity to extend my thanks.

Macroscopic Appearance.—Hyperemia and edema of the meninges of the brain and cord, dilatation of the large vessels of the pia mater of the cord. The cortex of the brain is somewhat swollen and reddish, and the line of demarcation between the gray and white matter is indistinct. Small subcortical hemorrhages are seen and the capillaries of the centrum semiovale are dilated. The ventricles do not contain any fluid. The gray matter of the cord is red or brownish-red and the line of demarcation between it and the white tracts has disappeared. There are present small hemorrhagic points in the anterior and posterior horns. The white matter has a peculiar grayish and translucent appearance. In some parts of the cord and pons distinct areas of softening are seen.

Microscopic Appearance of the Pia Mater.—The arteries and veins are dilated and filled with normal blood or a homogeneous mass, which resembles a hyalin thrombus. (This, however, Dr. Strauss considers an artifact.) The connective tissue spaces are dilated and are filled with small mononuclear cells resembling small lymphocytes; they also contain a smaller number of larger cells with large, pale, round, or oval nuclei (endothelioid cells). The mononuclear infiltration is most marked in the sacral and lumbar segments of the cord, but is also present to a less marked extent in the dorsal region and in the pia covering the medulla, pons and crus cerebri.

Microscopic Appearance of the Cord.—The arteries, veins and capillaries are markedly congested and contain either normal blood or homogeneous masses resembling thrombi, which are probably artifacts. Small miliary hemorrhages are present in the gray matter. The most marked changes are the perivascular, or, rather, adventitial, infiltrations. This infiltration is both diffuse and focal and is most marked in the sacral and lumbar region of the cord. Where the inflammation is severe, the ground substance is amorphous or granular and the glia network is indistinct. The ganglion cells exhibit various degrees of degeneration. In some there is a total disappearance of the cytoplasm and even nuclei. Perivascular infiltrations are always present about these degenerated ganglion cells, thus demonstrating the secondary nature of the degenerative process in the ganglion cells. The round-cell infiltrations are also present in the medulla and pons; the ganglion cells of these parts of the nervous system show very little change.

In addition to these characteristic changes in the nervous system there were also found congestion of the lung, associated with areas of bronchopneumonia; parenchymatous degeneration in the liver, kidneys and spleen; and enlargement of the follicles of the intestines and mesenteric glands.

It is Dr. Strauss's opinion that these changes in the follicles of the intestinal mucosa and the enlargement of the mesenteric lymph nodes indicate that the intestines may be the portals of entry of the infective agent.

The prognosis of the cases complicated with bulbar symptoms is very unfavorable. Four of the seven bulbar cases died. None of the cases in which bulbar symptoms were absent terminated fatally.

The treatment was entirely symptomatic in character. Rest in the early stages was insisted upon. After the lapse of seven to ten days strychnin or nux vomica was administered by mouth. Massage was not begun until after all acute symptoms had subsided. To prevent dropfoot, a frequent sequela in these cases, early support of the foot was obtained by adhesive straps or splints. The treatment of the subsequent deformities was left in the hands of the orthopedic surgeon.

Re-examination.—Fourteen cases returned for a re-examination during January, 1909, that is, within twelve to twenty months from the time of onset.

NAME.	ORIGINAL PARALYSES.	STATUS AT TIME OF RE-EXAMINATION.
C. B., 21 months.	Both arms, right leg, muscles of back and neck, knee-jerks diminished.	Contracture of right hand, reflexes normal. (Knee-jerks.)
S. W., 3 years.	Both lower extremities, incontinence of feces.	Paralysis of both lower extremities.
M. C., 11½ months.	Left arm, right foot, unable to hold up head, sit or walk.	Can hold up head, sit and walk, can move left arm fairly well, no atrophy or contractures, ulnar reflexes present; atrophy of right leg, reflexes present. (Knee-jerks.)
F. K., 18 months.	Paralyses of both legs knee-jerks absent.	Atrophy of thigh and leg, foot drop, ankle frail, no contractures.
K. S., 3 years.	Paralyses of upper and lower extremities, dysphagia, all reflexes absent.	Atrophy of right leg, knee-jerks present.
S. T., 18 months.	Paralyses first upper then lower extremities, knee-jerks absent.	Cannot raise left arm, forearm only slightly, complete paralyses of right upper extremity, flail shoulder joint; right knee-jerk slight; left knee-jerk not obtained; paresis of both lower extremities, bilateral dropfoot.
J. K., 3½ years.	Paralyses of both lower and upper, knee-jerks diminished.	Atrophy of right shoulder and arm, reflexes absent; lower extremities marked atrophy, loss of knee-jerks.
A. T., 5 years.	Weakness of left leg, left foot in talipes equinovarus.	No paralyses.
C. K., 18 months.	Dropfoot on right side, absence of right knee-jerk, inability to extend leg on thigh.	Right talipes equino-valgus, some atrophy of right leg, right knee-jerk absent.
L. M., 18 months.	Knee-jerks absent, inability to support head.	No paralyses.
R. D., 3 years and 6 months.	Cannot stand, absent knee-jerks, does not talk.	Imbecilic; says mamma and papa; incontinence of urine and feces, knee-jerks absent.
E. A., 6 years.	Knee-jerk absent on left side, has a Kernig rigidity of neck. Left lower extremity paralyzed.	Atrophy of left thigh and leg, reflexes present. (Knee-jerks.) Scoliosis.
R. F., 10 months.	Paralyses of both upper extremities.	No paralyses or atrophy.
A. F., 8 years.	Total paralyses of upper and lower extremities, knee-jerks absent.	Paresis of upper extremities, more marked on right side, slight contracture of right hand. Bilateral atrophy more marked on right side. Walks without limp, moderate atrophy of both extremities, more marked on left side. Knee-jerk present on left side, absent on right. No facial palsy or strabismus. Pulse regular, 100.

I am indebted to Dr. Herman Schwarz for the inclusion in my series of 7 cases from his dispensary service at Mount Sinai, and to Dr. Walter J. Heimann and Dr. S. Feldstein for their kind assistance.

A CASE OF SO-CALLED CONGENITAL MALARIA.*

BY FRANK S. MEARA, M.D.

The subject of this communication was admitted to Bellevue Hospital during the first week of December, 1906, at the age of seven weeks. The child was born in the middle of October at Massapequa, Long Island. The date has significance with reference to the mode of infection.

Family History.—The mother was a young woman in her early twenties, a Russian Pole, who came to this country three years before. She lived in New York City for two years. One year ago she married and moved to Massapequa, Long Island. Last August, when seven months pregnant, she was taken ill with chills, fever and sweats. Her chills and fever continued for three weeks. Most of this time she was confined to her bed. She was finally apparently cured by quinine. Since then she had no other manifestations of her malarial infection except boring frontal headaches and malaise.

Her husband was sick at the same time and in the same way and was confined to his bed for one week. He, too, was cured by a course of quinine.

For two weeks prior to the birth of the child the weather was freezing every night at Massapequa. The mother was absolutely positive that there were no mosquitoes about the house or out of doors since the infant's birth.

For the first two weeks of its life it was what the mother called a large, healthy baby, but *at the age of ten days or two weeks*, though on the breast, taking its food fairly well and having yellow stools, it still seemed to cry a good deal and lose weight. For another week this loss of weight continued while on the breast and the color began to be poor. The mother now became thoroughly alarmed and took the child to New York, where she carried it from clinic to clinic seeking relief. In the meantime a swelling developed in the groin and scrotum, for which latter condition she brought the child to Bellevue.

The little patient had had some cough for four weeks before admission. He had nursed at the breast for five weeks and since that time had been on cow's milk. He had been constipated and of late had vomited twice a day.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 28, 1909.

The child had had no symptoms that could have been interpreted as infection with the malarial organism; neither fever, chills, convulsions, cyanosis nor gastrointestinal disturbances other than those mentioned.

The discovery of the real condition was due merely to the findings of the routine examination, as the case had been admitted as a hydrocele of the cord.

Examination.—The patient is a male child, strikingly anemic. The head measures 13¼ inches in circumference; chest at the nipple line, 13 inches; abdomen at its most prominent point, 12¼ inches; length, 20 inches. The weight is 7 pounds, 9 ounces. The anterior fontanel measures 1¼ by 1½ inches. The posterior fontanel is closed. There is a slight craniotabes. The conjunctivæ are pale, otherwise the eyes are negative. There is a slight coryza. The mucous membranes of the mouth are pale. The cervical glands are shotty, the axillary palpable, the epitrochlears not felt. The chest is normal in outline. Auscultation reveals both in front and behind coarse rhonchi and a few fine râles when the child takes a deep breath. The heart sounds are normal. The abdomen is prominent and there is a diastasis of the recti muscles with a slight protrusion between.

The spleen fills the whole left side of the abdominal cavity, the edge reaching the middle line. The edge is fairly sharp and when the muscles are relaxed the notch can be beautifully made out.

The liver edge is 1¾ inches below the costal margin, which in so small a child reaches nearly to the level of the umbilicus. There is swelling in the right side of the scrotum and in the right inguinal canal, due to a hydrocele of the cord.

The blood was examined and found loaded with malarial organisms. The mother's blood was also examined and found to contain the organism.

Blood count gave 11,000 white cells; polymorphonuclears, 16 per cent.; lymphocytes, 84 per cent.

Only on three occasions did the temperature go above 99°F., after the first day when it was 99.5°F. On the second day after admission it was 100.4°F., on the eighth day 100.8°F., and on the tenth 100.6°F.

It was put on a modified milk mixture, representing a caloric value of between 350 and 400.

The child lost weight rapidly, and this loss of weight was the most significant expression of its infection and certainly could not be attributed to lack of nourishment. In three days it dropped from 7 pounds and 9 ounces to 7 pounds and 3 ounces; in two days more to 6 pounds and 11½ ounces and in two more to 6 pounds.

The bimuriate of quinine and urea was begun in gr. v. doses three times a day on the 11th. The child died on the 14th.

I am indebted to the Pathological Department, under Dr. Chas. Norris, for the report appended.

"Blood films of December 11th: Blood shows marked poikilocytosis, great variation in size of red cells, numerous nucleated reds, mast cells and a few myelocytes. Plasmodia malariæ of the tertian type are found in great numbers and great variety of form. There are numerous signet and ameboid forms, as well as fairly numerous sporogenetic forms within the red cells. No extracellular forms were found in the slides examined. Films examined on the following day (December 12, 1906) contained practically the same forms of plasmodia as those described above.

"Attempts to demonstrate flagellate forms by incubation, followed by staining, were unsuccessful at this time.

"Examination of the smears made at the time of autopsy from the spleen were wholly unsuccessful in demonstrating presence of plasmodia in this organ. This failure may be ascribed to the comparatively long period of time elapsing between the death of the infant and the postmortem examination.

"On December 14th, examination of the stained blood films from the mother of the patient showed numerous signet and ameboid forms of the tertian parasite."

The autopsy showed a large spleen corresponding to the size made out before death.

Before Laveran's studies of the blood in malarial subjects, the pathogenesis of such a case as that cited above would have had, and, indeed, did have, but one interpretation, an infection of the fetus in utero by the mother; but with the knowledge of the protozoon as a causative agent and the further knowledge of its life cycle and the mode of transmission from mosquito to man, there arose a double question as a bar to the acceptance of intrauterine infection; first, the permeability of the placental structures to such an organism, and, second, the exclusion of the ordinary method of extrauterine infection.

These doubts have steadily grown into a certainty in the minds of most students of the disease in question, and yet that there is not an entire unanimity of opinion on the part of authorities is startlingly obvious on consulting the remarks of the two men contributing articles on this subject in the last edition (1905) of the *Traite des Maladies de l'Enfance* of Grancher and Comby. In Vol. V. of this treatise J. W. Ballantyne, of Edinburgh, writing the articles on "Maladies de Fetus," says, with reference to malaria, that "several observers have shown that malaria can attack the fetus in utero," and quotes R. W. Felkin (*Transactions of the Edinburgh Obstetrical Society,* 1889, Vol. XIV., p. 71) as having noted a case in which the infection seemed to have been of paternal origin rather than maternal. This report, while justified in 1889, when Felkin wrote, goes unchallenged in 1905 by Ballantyne, who further remarks: "Personally, I have observed at the Royal Maternity of Edinburgh a case in which the woman, during the first days following her labor, had recurrent attacks of intermittent fever. Her newborn was likewise attacked, and in the blood of both were found the characteristic hematozooa of malaria. During pregnancy the fetus can have chills synchronous with those of the mother, and which can be perfectly well recognized. In these cases the child is born with a large spleen." These last sentences of the quotation, following on the statement of his case, would connote his own acceptance of intrauterine infection.

In Vol. I. of the same treatise Luigi Concetti contributes the article on "Malaria." He says that the idea that malaria can be transmitted from the nurse to the infant by the milk or from the father to the child by spermatozoa must be dismissed. Discussing maternal intrauterine infection, he says that a case of Bein is the only one in which findings in the blood of a newborn of the parasite was at all positive, and in this case the blood was not examined until several days after birth, which does not exclude the possibility of infection after birth.

Thayer, in his lectures on the malarial fevers, 1897, speaking of congenital malaria quotes a case reported by Duchek as the most positive with which he is conversant, concerning a child of a malarial mother, which died shortly after birth, and showed on autopsy an enlarged pigmented spleen and pigment in the portal vein.

Laveran himself (see Peters' article) was a champion of this mode of infection and quoted to support his view in addition to the case of Bein and Duchek, others reported by Sue, Hawelka and Bouzian.

The negative results of careful investigations, with reference to this mode of infection, are more convincing than any positive reports yet made, none of which will stand rigid criticism.

Thayer (*loc. cit.*) studied the blood of a child born at the eighth month during a malarial paroxysm of the mother. In the mother's blood were three groups of the quartan parasite; the child's blood, on repeated examinations, was free from parasites or pigment. Examination of the placenta showed parasites and pigment on the maternal side and neither on the fetal side.

Among others who have studied the blood of fetuses of malarial mothers with negative results are Bignami and Guarnieri, Bastianelli, Caccini, Pennato, Ferroni quoted by Concetti, Marchiafava and Bignami quoted by Peters, and S. Serini quoted by Pezopoulos and Cardamitis. These are names, the connection of which with malarial hematology must carry weight.

The last detailed study of this group of cases was carried out by Pezopoulos and Cardamitis, of Athens. They examined the blood of 6 mothers suffering from malarial fever and the blood of their newborn. They also examined the blood of the placenta in 5 cases both from the maternal and fetal surfaces. Two of the infants dying one to two days after birth were autopsied and sections of the liver and spleen examined. Sections were also examined microscopically from the placenta.

The results of these examinations were as follows: In the blood of these 6 mothers there were malarial parasites more or less abundant.

In the blood of the infants and the aborted fetus there were no parasites.

In the blood of the liver and spleen, as in the sections of these two organs of the infants autopsied, there were no parasites.

In the blood of the 5 placentas taken from the maternal surface there were malarial parasites in abundance and the most of the forms undergoing schizogenesis, while in the blood taken from the fetal surface there was no such parasite.

In the blood of the umbilical cord there was no malarial parasite. Even in the blood of the placenta of the aborted fetus (six months) there were no malarial parasites.

They go on to say: "The presence in the blood of the maternal placenta of numerous malarial parasites in the act of schizogenesis, demonstrates that these parasites sojourn a long time in the placenta and probably in the vascular lacunæ into which the cotelydons plunge and where the vessels coming from the uterus end. These lacunæ, because of the slowness of the circulation, represent, it appears, one of the places where the parasites take refuge to multiply, but they cannot pass hence into the vessels of the villosities. It is, indeed, probable that some microbes pass through the placenta and infect the fetus, but it would be rash to judge by analogy by admitting that the malarial parasite can pass through the placenta also. For the white cells are, as is known, attracted with eagerness toward the vegetable parasites, and seizing them in the lacunæ where they are found transport them by ameboid movement through the vessels of the villosities, while, with regard to the malarial parasites which are animal, these globules do not appear to be attracted with the same avidity, at least as long as these parasites are living. To this conclusion our observations lead us, for in several thousands of preparations of blood containing malarial parasites which we have examined up to the present, we have seen only a very few which were engulfed by the leukocytes. From all this we can conclude that the opinion of those who think that the malarial parasites do not cross the placenta is correct."

It will be seen that none of the positive cases will stand a rigorous criticism, as in none of them could an extrauterine infection be excluded, the organism having been detected in each instance some days after birth. The negative cases carry more conviction, as in each instance the examination was made at the time of birth and the results have been uniform.

If, then, we accept a denial of intrauterine infection as proven, or, at least, as highly probable, and if from the season of the year and the absence of the anopheles in a given environment we exclude the usual means of an extrauterine infection, a third method of transmission must be sought to explain such a case as we have under consideration.

Concetti says, apropos of this class of cases: "Only in one case can we conceive of the transmission of malaria from the mother to the fetus, it is in the case of a placental hemorrhage, either during pregnancy or at the moment of delivery. But in this case it is a simple transmission by inoculation, . . . with the absorption of blood from the maternal placenta, rich, as we have seen it, in malarial parasites."

This was the explanation given by Peters to account for the mode of infection in his case, which, in many particulars, was strikingly like my own. This child was born during a malarial paroxysm of the mother. It was healthy at birth. On the fiftieth day after confinement the mother brought the child for treatment and the next day organisms of the tertian type were found in the blood.

The first expression of malarial poisoning in the child was probably in the second week, when the mother said the child "got cold and had fevers." The infant had always been pale, but not enough to cause alarm until a week before she brought it in. It was extremely anemic, the skin slightly yellow and the spleen 3 cm. below the costal margin. The temperature never was above 99.7°. It was cured by quinine, gr. i. *t.i.d.*

Dr. Floyd Crandall reported a case in the New York Polyclinic February, 1903, that seems, indeed, to have been an intrauterine infection. The child was born of a malarial mother, in a precipitate labor and had a paroxysm eighteen hours after birth. The malarial organism was found on the third day. There was no enlargement of the spleen, which, taken with the character of the labor, makes it possible that there had been some disturbance at the placental site, permitting of a mingling of the fetal and maternal bloods and, hence, an inoculation.

Not only does the fetus escape the infection from the mother, but seems not even to share with her the depraved blood and nutritional states from which she suffers. To quote Concetti: "One might say that the fetus enjoys a certain immunity in the presence of the secondary effects of the infection, that is to say, of the intoxication which is the immediate product of it (toxins of malaria)." Pezopoulos and Cardamitis express themselves to the same effect and attribute the fact to a natural resistance on the part of the child to a malarial parasite and its toxic product.

It will be recalled that in both Peters' case and my own the infants were said to be perfectly healthy at birth.

Concetti says that Valagussa and himself have seen circulating in the blood of certain infants large numbers of benign malarial parasites, without the febrile reaction that might be anticipated. Hence, he argues that infants have an immunity, not against the parasites, but against the toxins.

Koch reports that most of the children of natives of Africa, though they, in appearance, are in perfect health, harbor in their blood the malarial parasite. Pezopoulos and Cardamitis also report finding in the blood of an infant of thirty-five days numerous parasites, though the child seemed in perfect health and never suffered from fevers.

That this immunity does not obtain in all cases and that the infant may be even more susceptible than the adult is shown by Peters' case and my own, the latter suffering from a pernicious type of the disease, in the end proving fatal.

It is generally appreciated that the sequence of events in malarial poisoning differs from that in older children and adults. There is no chill, but rather cyanosis of fingers, lips, ears, nose, or even general drowsiness and prostration, vomiting and often diarrhea. There is little or no fever, or, if high, of the remittent, rather than intermittent, type. In the case here reported none of these symptoms were noted.

Clinically, then, this picture was not one of malaria, but rather of the symptom complex described by von Jaksch, showing extreme anemia, a very large spleen, an enlarged liver, a blood picture of anemia or lymphatic leukemia of the sublymphemic type, a reaction of the hematopoietic organs, poikilocytosis, anisocytosis, numerous nucleated reds, a few myelocytes and mast cells.

I am sure that, given this picture in the infant six months later, with an absence of the malarial organisms, there would be no hesitation in including this under the designation of anemia pseudoleukemia infantum. To my mind it adds support to the contention of many clinicians that von Jaksch's disease is but the expression of blood destruction and hematopoietic reaction, induced by toxins of varied derivation.

SERODIAGNOSIS OF SYPHILIS IN PREGNANT WOMEN AND NEW-BORN INFANTS. Bar and Daunay (*Obstétrique,* Paris, II., N. S., No. 1, pp. 1-80) have applied the Wassermann test to 82 pregnant women and tabulated the findings. Negative results were obtained in several cases of unmistakable syphilis, so that negative findings do not justify the assumption that the woman is free from syphilis. But a positive result, in countries where trypanosomiasis is not prevalent, justifies the conclusion that the woman is infected. Their experience shows that the proportion of positive findings is much less when the women have been properly treated. A positive result should be accepted as the proof of active syphilitic infection, either in the woman or the fetus, or both, requiring specific treatment.

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TERTIAN MALARIA (GOLGI TYPE), WITH GASTRO-INTESTINAL SYMPTOMS.*

BY JAMES J. PHILIPS, M.D.,
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The digestive apparatus in infancy and childhood plays an important rôle in tertian infections. The anorexia and coated tongue, however, the occasional vomiting, the transient constipation or diarrhea so commonly observed, do not represent the diseased picture which I desire to present, in so far as they may be referred to an altered state of secretion or motility, or to a relative functional inactivity of the organs. It is enough, in this regard, to say that the infantile intestine, by virtue of its marked irritability, reacts so easily to disease, especially if such disease be of an infectious nature and run a febrile course, that such symptoms are but by-effects and hold a casual relation, by analogy, to most affections.

There develops, on the contrary, among children, an informal or aberrant type of tertian infection, which finds primary expression in a more or less severe disturbance of the gastrointestinal tract. Milder cases develop during apparent good health, or upon the basis of an unimportant disturbance of the digestion, acute anemia, anorexia, vomiting, gaseous abdominal distention, frequent movements, greenish in character and undigested, which do not respond to ordinary treatment and run a persistent course with periodic exacerbations. When the case is one of a general toxemia, in which the nervous system shares, the more severely infected exhibit these symptoms intensified and there supervene acute diarrheas which present in their course the picture of severe infection. The movements are frequent, serous in character, indicating involvement of the small intestine, contain an admixture of mucus and undigested food, are scalding and associated with complete anorexia and vomiting. In onset and progress, in inroad upon strength, vitality and well being, the condition simulates closely the gastrointestinal catarrhs of bacterial origin. When in addition it is the case of invasion of the intestinal mucosa with the parasite, usually that of the rectum or the lower bowel, the course is still more stormy and the movements change in character with increasing content of mucus and blood. The anorexia and vomiting become difficult of control, the loss of flesh and strength is rapid, the asthenia becomes pronounced, the anemia acute, while the diarrheal and dysenteric states combine to constitute the overshadowing symptoms which threaten the life of the child. If, in its further progress, sloughing appears, we have at hand a condition which simulates typhoid in hemorrhage and ulceration.

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* Read in the Section on Pediatrics and before the North Carolina Medical Association in session at Asheville, June 15-18, 1909.

I thus briefly sketch the types which the infection may assume, and it is essential to recall such disease pictures as referable directly to tertian infection to the exclusion of typhoid, dysentery proper and the catarrhs of bacterial origin. Moreover, the condition, as I have observed it, is quite independent of chill and splenic tumor; in onset is not uniformly associated with fever, nor is it the rule that it follows in the wake of a tertian infection to constitute a complication, but, contrariwise, may at once usher in the attack and clinically express the seizure. To indicate the idea, I begin the history of one or two cases which clearly express the onset.

A male infant, twenty months old, bottle-fed, moderately rachitic, but otherwise in good health and preservation, has onset of illness with nausea, vomiting and diarrhea—four to six loose, green and watery movements containing undigested food and some mucus. The seizure is a sudden one and continues for three days with considerable straining at stool and an occasional fleck of bright blood. There is neither chill nor pyrexia. At 11 P.M. of the third day fever is noted (102°F.) and a restless night follows, made so by vomiting, abdominal discomfort (gas) and five loose, green, watery movements. Examination is made the morning of the fourth day—temperature, 101.2°F.; pulse, 94; respiration, 22. The child is languid, eyes weak with feverish overcast, conjunctivæ subicteric, tongue coated, pale and flabby, tonsils free from exudate, fauces injected. An occasional cough with a few moist râles in each chest, liver not enlarged, spleen not felt, abdomen greatly distended with gas though everywhere soft, tympanitic and free from tenderness to pressure. Blood examination shows in fresh specimen, melaniferous leukocytes and free pigment; in stained specimen, tertian organisms, some full grown, and pigmented; and some young forms.

Close upon this follows the beginning history of another case, which concerns a nineteen-months-old infant, breast-fed to the eleventh month, bottle-fed afterward, a well covered, well developed child, healthy until its recent advent into a malarial district. Eight days prior to observation she became ill with a train of digestive symptoms. There was refusal of food, which persisted with occasional vomiting, the movements were frequent with moderate tenesmus, usually watery and green, occasionally containing more or less mucus and at times a small amount of blood, bright, unclotted and evenly distributed in the mucus, indicating its low origin. At the time of observation she was having six to eight such movements daily, was completely nauseated and relaxed. She had had neither chill nor fever. Heart and lungs normal, intellect clear, no evidence of rickets, reflexes normal. Abdomen was distended and tympanitic, though everywhere soft and free from tenderness to pressure. Spleen was not to be felt. Striking was the ill appearance of the child and the acute anemia visible in countenance and mucous membranes. Slight sweating on forehead. On the next, the ninth day of illness, at 9 A.M. the temperature was 100.4°F.; at 3 P.M., 99.3°F.; normal at evening. Five movements during the day in character as above. The tenth day was apyretic, with intestinal symptoms continuing unabated. On the eleventh day, at 9 A.M., the temperature rose to 102°F.; at noon it was 101.3°F. Blood examination showed tertian organisms, Golgi type, both half grown and young forms.

Here are noted conditions distinctly intestinal, and though associated with the tertian organism are without chill, without splenic tumor and, for practical purposes, not revealing their true nature until the appearance of fever on the third day in the first instance, on the ninth and eleventh in the second instance, which said appearance prompted the blood examination. They bring clearly to view the feature of onset with gastrointestinal symptoms, a continuation of the same with toxemia, distinctly malarial in origin, yet unassociated with chill or splenic tumor and with no grade of pyrexia inconsistent with a gastroenteric catarrh of bacterial origin, suggestive only in its periodicity.

If these symptoms are not heeded and no correct attempt is made to relieve through the management below suggested, they continue. A true diarrhea promptly develops, with a sharp rise in temperature, and the clinical picture becomes enlarged. The condition assumes the character of an intestinal catarrh with profuse and diarrheal evacuations, the abdomen is uniformly distended, the fever assumes a remittent type, exhaustion becomes rapid and complete, and, further, as an evident sign of severe intoxication, symptoms of a marked irritation of the nervous system develop, particularly in the young and highly strung child, which threaten life, and involve the whole organism in sympathy.

Another course of events is seen where there is a constant increase in the severity of the gastroenteric symptoms associated with hemorrhage and continued pyrexia. This condition may succeed the onset without intervening periods of remission or improvement and correspond to a severe grade of infection with involvement of the intestinal mucosa. It is indicated by constitutional symptoms, which soon become manifest, by increase in the amount of mucus, by repeated appearance of blood in the stools and of tenesmus during defecation. The tertian organism is not alone in the peripheral circulation, but becomes locally implanted, and the boundary lines between these inflammations of the large intestine and true dysentery (Shiga, Kruse, Flexner) do not appear to be at all sharp. What we clinically observe may be set forth in the continuation history of Case 2, presenting from the eleventh day on a low grade of continued fever and the following history:

Between the dates of May 28, 1908, and June 5, 1908, there occurred thirty-nine movements. Some of these were green, with much mucus and very foul in odor; others similar in character streaked or mixed with blood; others, still, of almost pure blood, bright-red and associated with mucus, though not intimately mixed. At times, when milk was the diet, curds appeared with regularity. There was abdominal distention, straining at stool, with pain before the defecation and in the sigmoid region, over a circumscribed area, more or less acute sensitiveness to pressure. The appetite was fairly maintained. Splenic enlargement did not appear, nor chill, throughout the course of illness. Repeated examination of the blood showed tertian organisms and a favorable termination resulted from occasional doses of camphorated tincture of opium and rectal injections of quinin.

In this case, the gastroenteric symptoms overshadowed the original infection. In type it departed from the normal in the absence of classical onset and in the termination in a dysenteric state, whose true nature and symptoms would have been misleading, had not early recourse been had to the blood examination.

In prolonged cases, such as have received no adequate treatment, convalescence from the first onset may, without any manifest cause, be interrupted by one or more relapses. These periods of improvement and apparent cure, alternating with relapses, may continue through many weeks and contribute a striking feature to the condition. Arising in an acute way, associated with more or less fever, after a period of bowel quiescence and succeeding a convalescence, which may have been present for some days and given the promise of being complete, there is initiated *de novo* a condition which varies in no wise and character from the original seizure, which may be expected on the seventh or the tenth day from the last onset and with which, without exception, the young malarial organism becomes again associated.

It is a serious mistake to accord these children the customary measures for gastrointestinal conditions, for the fully-developed symptom complex is apt to be fatal through toxemia, diarrhea, exhaustion and hemorrhage. Sometimes this is the case in spite of a clear conception of the condition and the every effort of intelligent therapy. More often is it true with those who have been treated by diet, intestinal disinfection, astringents, etc., upon the basis of a bacterial infection, and who, without improvement and steadily growing worse, have entered a state which a little reflection will show to be an expected, perfectly natural and logical consequence. The prognosis in such a course of events is very unfavorable.

In accordance with the hypothesis, a reaction must be brought about through antimalarial remedies and the condition met by these means. The cases mentioned have been so managed and cured upon this principle solely. Accessory to quinin of undoubted value are fractional doses of the mild chlorid and a diet of broth. Colonic irrigations have proved helpful to me also in increasing the strength of the heart's action, in checking the loss of fluids from the system, in diluting the toxins in the body and favoring their excretion through renal stimulation.

Concerning the method of administration, I have met a serious obstacle in the exhibition of quinin by mouth. Vomiting is consistent and irritative phenomena appear under this procedure, which deprive the stomach of all function. So that following the irrigations of normal salt solution, I throw up into the bowel for retention as high as possible a solution of quinin bisulphate based upon the age and relative weight of the child. This procedure is in case of necessity repeated every three to four hours, and a sufficient time must be allowed for this duty. It is the most prominent and, by all odds, the most successful form of treatment, and, if properly executed, improvement will quickly follow. The fever falls and the general appearance improves. The movements become less frequent, approaching nearer and nearer the normal. It is surprising at times to note the short time requisite to bring about a tranquil condition of the intestines and shortly afterward formed stools. The blood and mucus are removed, the secretion of urine increased, which is an especially favorable sign. The stomach resumes its function—in short, a reaction appears which, if maintained, removes the danger.

URINARY BACTERIAL INFECTIONS IN CHILDHOOD. Box (*Lancet,* January 11, 1908) discusses descending and ascending urinary affections in childhood. He considers that the common cause of bacilluria is due to an ascending infection, a view which is corroborated by the sex incidence of the disease. It is twice as common in females as in males. The commonest infection is that of the colon bacillus. This bacillus is frequently present in the urine of children suffering from thread worms, which suggests that scratching may be in part the medium of infection. The clinical manifestations of infection of the urinary passages in childhood may be pyelitis, cystitis or incontinence of urine without obtrusive evidence of local inflammation. The possibility of the presence of pyelitis should always be borne in mind when dealing with cases of obscure fever in childhood, whether of a sustained remittent, or of a relapsing character. Cystitis of a more or less acute character is not at all uncommon in childhood. In incontinence the course of the disease appears to be not altogether afebrile. Slight elevation of temperature at night, rarely over 100°F., may occur for weeks at a time. The cystitis of childhood, when caused by the colon bacillus, calls for a guarded prognosis. Some cases, especially those with acute onset and marked bladder symptoms, clear up under the simplest medicinal and dietetic treatment.—*Woman's Medical Journal.*

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REPORT OF TWO INTERESTING DERMATOLOGICAL CASES.*

BY CHARLES JACK HUNT, M.D.,

Philadelphia.

The reason for the report of these 2 cases is found in the character of the lesions, their association and mode of onset. In both there is a certain similarity as to the personal history, and the character and distribution of the lesions were identical as to region. They appeared on the tips and on the extensor surfaces of the phalanges of the upper extremities, as distinct vesicles of large size, without an inflammatory areola, caused a separation of the epidermis from the corium, were filled with a sterile serous fluid, and were accompanied locally by itching, burning and heat.

The first case, E. M., a girl of ten years, had fallen while at play, striking her hands rather severely. She complained at the time that her hands "stung," but no lesions of any type were observed, though the hands were somewhat reddened, especially the right. For relief, the child put her hands under cold water and immediately lesions of the type described above appeared. I saw her an hour later. At the time of the examination the vesicles were of considerable size and were distributed over the tips and somewhat on the extensor surfaces of all but the fifth phalanx of the right upper extremity. Three of them became larger later that day. At the second visit I opened them and found a serous fluid without any evidences of blood or pus. A microscopic examination was negative. At the time the patient had a temperature of 99°F., pulse of 100; she was very nervous, but had no discoverable lesions or constitutional symptoms of any character. The urine examination made the succeeding day was: S. G., 1,029; dark amber, acid; albumin and sugar negative; indican, a marked excess; microscopic examination, negative. It was impossible to get a clear family history. The following is the history of previous illnesses in the patient: She had pertussis at two, which merged into an attack of measles; these were apparently uncomplicated. At a later date she had an attack of varicella and at her sixth year and later on suffered considerably from rheumatism in the upper and lower extremities. She had been seen previously by the observer because of three different attacks of infectious blepharitis, complicated in every instance by a facial tic, which involved, for the most part, the muscles of the eyelids. She had had frequent mild attacks of urticaria and one severe attack which was associated with aching of the extremities. A careful physical examination showed that she was totally negative except for enlarged tonsils, which were removed. The lesions healed without infection and there have been no recurrences.

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* Presented before the Philadelphia Pediatric Society, May 11, 1909.

The second case, W. B., a boy aged seven years, while riding on the street car, suddenly felt a sense of burning pain in his hand and found what he called blisters on the ends of his fingers. He called his mother's attention to it; she applied a mild ointment, and the next morning sent for me. I found a large-sized vesicle on the tip and somewhat over the extensor surface of the thumb of the right hand and another at the junction of the proximal phalanx and first metacarpal bone. There were smaller ones on the extensor surfaces of the fourth and fifth fingers of the left hand. There was no inflammatory areola. Microscopic examination was totally negative. The contents were serous in character. The boy complained of burning and pain, with itching, and there was some local heat. His temperature was 99⅕°F., pulse 104. There were no evidences of constitutional or organic disturbance at this date, except that the boy complained of aching legs and arms every night at bed-time. The blood and urine were normal. His previous history is as follows: His had been a normal birth, was breast-fed, weaned at eighteen months, and had received a meat diet, usually beef or mutton, every day since his second year, and he was not accustomed to much carbohydrate food. He had pertussis at his sixth year and has been subject to slight digestive disturbances for a long time past, especially in the last six months. Ever since his third year he has had a well-developed urticaria during the strawberry season, and during the last year had a severe attack of urticaria following excessive sweating while at play. He has complained of rheumatic pains in the extremities during the past winter more than during any previous winter. The family history shows that his mother and his brother had been subject to attacks of joint and muscular pains and to what are described as neuralgic headaches. On his mother's side there is a history in herself, two sisters and five brothers of attacks of urticaria and rheumatism of frequent occurrence.

The cases are of interest because of the acute onset unaccompanied by inflammatory or marked constitutional symptoms, the distribution, the localization and the associated history of urticaria and metabolic disturbances. Urticaria bullosa and the bullous form of erythema multiforme were thought of, but neither are of such character of distribution or present such a history of onset. It was suggested to me by Dr. M. B. Hartzell that in some respects they resemble epidermolysis bullosa hereditaria. However, this condition is extremely rare, the onset is associated with trauma of mild degree, may be found in any portion of the body, and the attacks are frequent.

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TO DISGUISE BITTER MEDICINE. In order to administer bitter medicines we usually resort to covering them in pills, capsules or wafers, but sometimes the liquid form is most desirable. Instead of exercising ingenuity in the direction of covering up the medicine, or disguising its taste with other materials, we may go to the physiological taste appreciation of bitterness and modify that. There are certain substances which have the power of paralyzing the terminals of the nerves of taste. Among these is gymnemic acid (C^{32} H^{55} O^{12}) a glucoside which is found in *gymnema silvistris* of the British pharmacopeia. It is also known as *mera-singi* and *kavali.*

This glucoside is similar to glycyrrhizic acid. Gymnemic acid has the curious property of temporarily destroying the sense of taste for sweetness and bitterness, although the taste for salty and astringent substances is not changed. It occurs in the form of a whitish powder which is soluble in water, but poorly soluble in diluted alcohol. It is not poisonous, and so far as is known has no harmful action. After rinsing the mouth with a 10 or 15 per cent. solution of gymnemic acid in water, to which a little alcohol has been added, quinin or other bitter medicine cannot be distinguished from sugar.—*New York State Journal of Medicine.*

PULMONARY GANGRENE IN CHILDREN, WITH REPORT OF A CASE.

BY WILLIAM PALMER LUCAS, M.D.,

Assistant in Department of Pediatrics, Harvard University Medical School.

During the past sixteen years in the medical service at the Children's Hospital there have been but 3 cases of gangrene of the lung. The case which I wish to report occurred in January, 1908. The child was a boy fifteen months old with negative family history. There was no tuberculosis in the family, and as far as could be learned the child had not been exposed to it. He was a normal child in every way except that he had been underfed, being fairly well developed, but poorly nourished. When he entered the hospital on January 4th his skin was rather pale, but his mucous membranes were a fairly good color. There were just the beginning signs of rachitis. All that was abnormal was located in the chest. The chest was slightly flattened, the rosary was marked, the breathing was symmetrical, there was no lagging of either side. The breathing was rapid. To palpation there was a slight resistance over the left chest, both anteriorly and posteriorly, more marked at the base. Percussion gave the same slight dullness all over the left chest, more marked posteriorly at the base. Breath sounds were a little distant all over the left chest, both anteriorly and posteriorly—slightly higher in pitch than normal, but no bronchial breathing. There were a few scattered areas with medium moist râles, high in the axilla and in the back, especially at the angle of the scapula. The heart was in normal position and area. The sounds were clear and normal. The abdomen was negative. The spleen was just palpable, as was also the liver. The extremities were normal, reflexes good, glandular system slightly enlarged.

The diagnosis of diffuse pulmonary tuberculosis was made. The opthalmotuberculin test was positive. He was running the ordinary course until the 15th, when there was a noticeable change for the worse. The breathing which was already rapid became more so; the signs in the chest were still very indefinite. The only change from the general dullness on the left was beginning hyperresonance at the apex. There was slightly more bronchial breathing behind at the angle of the scapula. The râles were more numerous, both medium moist and small crepitant. The heart action was more rapid. From this time on the signs became quite definite. The appearance of the child underwent a marked change. His color became very sallow, his breathing very labored; at times dyspnea was very marked; he began to have paroxysms of coughing which would last for two or three minutes and only stopped because the child seemed to be utterly exhausted. On the morning of the 19th his breath began to be very foul and gave the typical odor of some putrefactive process. Over the lower left chest, especially behind, cracked-pot sound became very evident, the breath sounds became more and more tubular and there were very coarse bubbling râles at the base, especially behind. At the apex there was hyperresonance and rather high-pitched breath sounds. On the right side there was hyperresonance with bronchovesicular high-pitched breathing with numerous medium moist râles. The Roentgen picture at this time showed the whole left lung, except at the apex, to be very mottled and about the junction of the upper and lower lobe there was an area of diminished density. From the location in the plate it appeared as if the area included the upper two-thirds of the lower lobe and the lower third of the upper lobe. The mottling was more especially marked in the upper lobe in the scapula region, whereas the base of the lower lobe was almost solid. On the 20th the child seemed very much worse, the gangrenous odor to the breath filled the room, the child coughed very little, lay on his affected side, but vomited frequently—a foul, brown fluid, in small quantities. The signs in the chest had simply increased. The whole central area of the left chest gave distinct cracked-pot sound and very tubular breathing, with very coarse bubbling râles. The child died late in the afternoon, and at the autopsy performed within a very short time there was found a complete gangrenous process involving both the upper and lower lobes on the left, with a large cavity in the upper part of the lower lobe and a smaller cavity at a very short distance in the lower part of the upper lobe, which in the Roentgen picture had given the appearance of a single cavity. Both cavities had a small quantity of very foul, brownish, rather dark fluid, with small pieces of dissolving lung tissue. The portions of the two lobes which were not involved in these cavities were riddled with smaller gangrenous areas. There were no thrombi found in the vessels and no emboli or foreign bodies made out. The right lung showed one or two small tuberculous nodules in the lower lobe. The liver and spleen were filled with numerous tuberculous nodules and all the abdominal lymph nodes were greatly enlarged. The small intestine also showed numerous tuberculous lesions. There was no meningeal involvement.

The history of this case represents fairly well the typical picture of pulmonary gangrene. Its occurrence is practically always secondary, appearing in the course of some very debilitating infection. There is probably no one etiologic factor in its production. It varies with the resistance of the patient and the virulency of the infection. Among the leading conditions in which gangrene may occur—first, aspiration pneumonia, especially of food, as this carries in the bacteria of decomposition perhaps more frequently than anything else. Lobar pneumonia, with delayed resolution, perhaps by pressure on the vessels, thus cutting off the circulation, may be considered, but it is more probable that in children the secretions are not coughed up, but rather it is a process of coughing in instead of coughing up. Gangrene of the lung probably occurs more frequently in tuberculous pneumonia than in any other primary lung condition, because of the general lowered vitality of the patient, the wasting process and the great amount of lung tissue involved, which give a long-continued poor blood supply. But beside these conditions we must have the presence of putrefactive bacteria before we can have a gangrenous process. Thrombosis and embolism of any of the pulmonary vessels may be causes, but are certainly very rare in children. Postoperative pneumonia has been mentioned by certain authors as being a cause, but probably is never so in children. Pleurisy, with effusion, may from mechanical reasons produce one of the factors which is necessary, that is, poor circulation, in starting this process. Abscess of the lung usually remains definitely as such, but may go on to gangrenous formation. Direct trauma of the lung tissue may very well carry in the necessary infection. Outside primary lung involvements, gangrene of the lung follows probably more frequently some of the debilitating diseases, more particularly measles in children. The bronchopneumonia which follows measles is so often tuberculous that with the presence of a lowered vitality there is the best chance possible for such an infection to occur. The bronchitis following typhoid and diabetes mellitus may also for the same reason cause this process. In some rare cases it may also be an extension from gangrenous processes in the mouth or upper air passages; perhaps in noma this is more frequently met with than in any other like process.

The symptoms of pulmonary gangrene are always masked by the symptoms of the primary disease, but the following points usually characterize the occurrence of this process. There is first the history of long duration of the primary illness with wasting and rapid loss of strength. There is usually a definite process in the lungs—at least, there must be an impaired pulmonary circulation. Taking this as the picture of a case, any fairly rapid secondary septic invasion, giving very few physical signs, but a very marked change in the appearance of the child, a pallid, often sallow and livid septic appearance, greater distress in respiration than can be accounted for by the physical signs. Early signs of cavity formation are not often to be made out, though they are often found late, and when present with the foregoing picture give a fairly definite means of diagnosis. As not a constant feature, but when present almost pathognomonic, is the gangrenous odor of the breath, if previously any gangrenous process of the mouth or throat has been ruled out, for such processes are very much more common in children than gangrene of the lungs. Still less constant is the spitting up of foul, putrid, sanguineous material, often very watery but as often mucopurulent with pieces of lung tissue. Paroxysmal coughing is a very suggestive symptom, with rapid distressing breathing. Dyspnea is often very marked. The pulse is usually rapid, small and wiry. The temperature often after the first septic elevation is subnormal. The whole picture gives one an unmistakable impression of an impending and distressing end, without enough change in the physical examination to account for the gravity of the situation. The sputum, if there is any, which is rare in children, is dirty and of a greenish hue and separates into three distinct layers, the bottom one containing pus and lung tissue, the centre being clear with perhaps a few shreds and the top rather brownish mucoid material. Vomiting, however, is more often present in children because of the sputum being swallowed and later brought up as vomitus. Pulmonary hemorrhage occurs in about a quarter of the cases.

The diagnosis, as can be seen, is rather one of inference than of direct findings, unless the gangrenous odor to the breath is present. At times it is impossible to diagnose gangrenous processes of the lungs from abscess or from putrid bronchitis.

The progress of pulmonary gangrene without intervention is rapidly fatal, although there are a few cases reported of slow and painful recovery, as one reported by D. J. M. Miller, which recovered after twelve weeks. Usually there is a rapid increase in the septic condition of the patient with the late appearance of fetor in the breath or in a paroxysm of coughing the bringing up of foul pus. If there is improvement, it comes later and slowly, sometimes after coughing up a large amount of pus. Rarely absorption is the means of relief, for the primary condition of the patient precludes very much resistance being left with which to combat any increased infection, so that without the early institution of proper treatment the outlook is very black. The earlier the diagnosis, or even probable diagnosis, the better the outlook from surgical procedure, which is practically the only, and unquestionably the best, line of treatment. Early operation, as Herczel has shown in 91 cases with 61 per cent. of recoveries, is then to be heartily endorsed. No matter how low or moribund a child may look, operation should be urged. Opening the thorax is only the work of a moment and has been found to be practically harmless in any lung condition if a mistaken diagnosis has been made, and it is far better to make such a mistake than lose the opportunity of giving the best chance to the child. Outside of surgical treatment, and, in fact, to be instituted along with surgical treatment, is the open air, or fresh air, treatment, with moderate stimulation and the highest possible nutritive support. These are measures of no secondary importance and are certainly primary when the patient refuses operation, as happened in the case reported, and the outlook with even the best of nursing is very poor. Among the complications are hemorrhage, empyema and metastatic abscesses. Hemorrhages occur in about 25 per cent. of the cases; empyema usually accompanies superficial gangrene, and metastatic abscesses, when they occur, appear more frequently in the brain than in the liver, kidney or spleen. The outcome in these cases is anything but cheerful, but if we continually hold the possibility of this condition in mind we may be able, with early diagnosis, to save a larger percentage of cases than has been done hitherto.

I am indebted to Dr. Thomas Morgan Rotch for the privilege of reporting this case, which occurred on his service at the Children's Hospital in Boston.

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A Case of Fatal Venous Hemorrhage from the Auditory Meatus in an Infant. Uchermann (*Archiv. f. Ohrenheilkunde*, Vol. LXXIV., 1908). The patient was an infant who suffered from a glandular abscess below the ear, on the sternocleidomastoid muscle, which ruptured into the auditory meatus. This was followed by suppuration and repeated profuse hemorrhages from the auditory meatus. Partial resection of the mastoid process was performed, for better inspection of the bleeding point, but the condition remained obscure. The antrum and middle ear appeared normal, the hemorrhage apparently coming from the innermost portion of the auditory meatus, near the tympanic membrane. Metastases appeared on the following day, and a few days later there was a terminal hemorrhage, to which the patient succumbed. The abscess had apparently emptied itself through the auditory meatus, as no more pus was noted later on; but, nevertheless, the venous wall became eroded through the abscess, which infected the resulting hematoma.—*Medical Review of Reviews.*

SOCIETY REPORTS.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Regular Meeting, May 11, 1909.

J. Claxton Gittings, M.D., President.

Polyarthritis Following Tonsillitis.

Dr. Arthur Newlin showed a pale boy of eleven years, who came to the Orthopedic Hospital on account of pain and stiffness in his knee joints. Dr. M. J. Lewis has kindly permitted Dr. Newlin to show him. Family history was negative. Except for scarlatina at three years he had always been well until a slight cold about a year ago, at which time the cardiac murmur was first noted. In December, 1908, he had an attack of tonsillitis lasting one week. He was apparently well for two weeks, then developed joint pains, first in the lumbar spine, then in the knees, which were swollen, stiff and painful, without tenderness, heat or redness. He complained not so much of pain as of inability to get about. The back had become better, but the knees showed little improvement. His anemia was more apparent than real—hemoglobin, 80 per cent.; erythrocytes, 4,600,000, and leukocytes, 8,000. The tonsils, submaxillary and inguinal glands were enlarged; other superficial lymphatics were not enlarged, nor was the spleen palpable. Cardiac dullness was increased and there was a blowing systolic murmur at the apex, transmitted into the axilla. The knees were swollen and painful, with no tenderness or redness of the joints. Decided swelling of the metacarpophalangeal joints of both index fingers, fusiform and painless, was noted. He had noticed nothing abnormal about his hands except that they were weak. There was distinct atrophy of the interossei muscles of both hands. An X-ray showed no change in the bones. It seemed evident that the polyarthritis was caused by an infection through the tonsils.

STILL'S DISEASE.

Dr. Newlin also showed a boy of fifteen years, native of the hilly country of Huntingdon County, Pennsylvania. His mother and one brother had goiters. He had always lived in a dry house. He had had attacks of rheumatic (?) pains in his legs, but was never laid up until August, 1907, when his joints swelled, the left ankle first becoming painful, red and swollen and the joint stiff; two months later the right elbow was affected. When presented, twenty-one months after onset, both ankles, both knees, the right elbow, both wrists and all fingers were affected. He was then in the Pennsylvania Hospital, and was shown by courtesy of Dr. C. D. Hart. He was pale and emaciated, unable to stand on account of the swelling and stiffness of his knees and ankle joints. The submaxillary, epitrochlear and inguinal glands were enlarged, the epitrochlear feeling as large as large peas. The spleen was palpable two fingers breadths below the costal margin. The joints of both ankles and wrists were ankylosed, as was the right elbow; the knees were partially so. The joints of the first and second phalanges of both hands were stiff and showed a fusiform swelling; the other joints affected were likewise swollen and puffy. There was no redness, pain or tenderness in any joint, but some bony grating at the wrist articulations. Arms and legs were semiflexed and efforts at extension were painful. The hips, shoulders and right elbow were unaffected and the articulations of the jaws had also escaped. Radiographs showed a porosity or rarefaction of the bones in the articulations involved, but there was no grooving or lipping. Blood count showed: hemoglobin, 76 per cent.; erythrocytes, 5,000,000, and leukocytes, 10,500; of the latter, 65 per cent. are polynuclear, 25 per cent. mononuclear, 7 per cent. transitional, 1.5 per cent. eosinophiles, and 1.5 per cent. unidentified. Both Moro and Wasserman tests were negative. An epitrochlear gland had been removed for examination.

Dr. J. T. Rugh mentioned that he had seen a number of similar cases, intensely interesting from the standpoint of etiology. Both of these cases illustrate the newer ideas of the toxic character of arthropathies. The first case had a tonsillar infection; the second resembled 4 others which he had seen in ten years, in all of which there was a primary tuberculous infection in the epiphysis of one of the long bones in the large joints. This disappeared and a polyarthritis developed. In his last case all the joints of the body were involved and the condition resembles arthritis deformans. In the treatment of these cases he had followed out a series of cases on fluid extract of bryonia and grindelia robusta, running them up alternately to the point of tolerance. In only one case, an old man over seventy, did improvement follow. His best results have followed pure tincture of iodin, given in doses of one drop an hour before, or two hours after, meals, also run up to the point of tolerance. In some cases of polyarthritis and arthritis deformans he has given as much as 10 to 14 drops of tincture of iodin.

Dr. Newlin said that, in the first case, salicylates were first tried without benefit, but there had been a steady improvement under syrup of the iodid of iron, together with ichthyol externally. In the second case iron was given internally and the affected joints were baked. There had been little change, but the patient had been made more comfortable.

LEUKEMIA.

Dr. J. C. Gittings showed a boy of eight years who was admitted with a history of weakness, anorexia and headache for four months. Blood examination showed high-grade anemia, 6,500 leukocytes, but 24 per cent. myelocytes in a differential count. The spleen and liver were enlarged. Frequent subsequent blood counts showed a gradual rise in the leukocytes to 40,000 and in the myelocytes to 40 per cent., followed by a gradual fall to normal within four weeks and a steady rise in the hemoglobin and red cells coincident with marked improvement in the general health and disappearance of all symptoms. As the blood picture permitted a diagnosis only of leukemia, the further course of the case would prove of great interest. The boy also showed slight loss of power with increased reflexes and clonus in the right arm and leg. The explanation of this was not clear.

TUBERCULOSIS AND SYPHILIS.

Dr. Gittings also showed a girl of one year, admitted to the University Hospital for paralysis of the left sixth and seventh cranial nerves and weakness with increased reflexes in the right arm and leg. The apex of the right lung showed consolidation and râles and the sixth examination of the sputum showed tubercle bacilli. The von Pirquet tests were negative, while the Wasserman reaction was distinctly positive. Lumbar puncture failed to obtain more than three or four drops of fluid. As the paralysis had appeared suddenly and had improved slightly on antisyphilitic treatment, a diagnosis had been made of tuberculosis of the lung and cerebral syphilis.

Dr. Alfred Hand, Jr., asked whether the first case could not be syphilitic. The boy does not look like a case of hereditary syphilis, but perhaps the presence of syphilis, as in a case reported by A. O. J. Kelly, had kept the ordinary symptoms of leukemia in abeyance. He believes that leukemia may occur without leukocytosis. The second case he also considered syphilitic rather than tuberculous. The eye findings could, of course, be due to either, but are more likely syphilitic.

Dr. Gittings said that syphilis in the case of the boy had been considered, but in the absence of any other luetic symptoms and because of the marked improvement of the blood findings on arsenic, the therapeutic test had not seemed justifiable. Opportunity for the Wasserman test had only recently become available, but would be employed.

DECAPSULATION OF BOTH KIDNEYS FOR ACUTE NEPHRITIS.

Dr. E. B. Hodge showed a girl of five years, admitted to the Children's Hospital in June, 1907. Edema had been noticed ten days before, first under the eyes, then in the feet, legs, abdomen, arms and hands. Ascites was present, and the urine, 6 to 10 ounces daily, contained albumin, hyalin and granular casts. On medical treatment she was worse at the end of eight weeks. On August 12, 1907, decapsulation of both kidneys was done. Both were enlarged, the right more so, and deeply congested. It was impossible to deliver the kidneys on account of the depth of the incisions through the edematous tissues of the back. Incisions were closed in layers by few sutures, loosely tied, without drainage. In spite of this, the stitches cut and the wound opened wide with subsequent infection and prolonged suppuration. Operation took 30 minutes. The patient was very ill for some time. In three days the urine reached 15 ounces daily and in two weeks averaged 20 to 25 ounces. Edema was less in one week and decidedly less in two weeks. By the end of three weeks she was nothing but skin and bone. Her convalescence was further retarded by gonococcic vulvovaginitis. At the end of a month she was sent to the country and in three months discharged with incisions healed. She had been perfectly well ever since and a specimen of urine obtained within the week showed no albumin or casts. There was not a trace of edema. Dr. Hodge showed her as a late result of double renal decapsulation for acute nephritis, nearly two years ago. The two patients operated on by Dr. J. P. Hutchinson and shown by Dr. C. H. Weber in 1906 were both alive and well, but had albumin in the urine. These three were the only cases on whom this operation had been performed at the Children's Hospital.

Dr. Gittings said that it was extremely important to determine the exact value and applicability of Edebohls' operation, so that every contribution to the subject is of great interest. The helpless attitude of the physician to so many of the nephritic cases is the strongest plea for the final decision on the operative treatment.

Dr. Hodge added that, while there had been 3 cases in the Children's Hospital with 3 recoveries, the mortality in a large series of cases must be far greater. Nevertheless, the operation is to be recommended in suitable cases. In answer to Dr. Elmer's questions, Dr. Hodge said that the kidneys had been operated upon consecutively by one operator, not simultaneously by two operators. The shock and the anesthesia both helped to diminish the amount of urine secreted immediately after operation.

Dr. Lefcowitch said that the child reported by Dr. E. E. Graham in 1906 was still alive and well.

INTERESTING DERMATOLOGICAL CASES.

Dr. C. J. Hunt, by invitation, reported the histories of 2 cases of a somewhat similar bullous eruption, appearing at the tips of the fingers in a boy of seven and a girl of ten years. (See page 531.)

Dr. F. C. Knowles suggested that one of the cases resembled somewhat the history obtained in a rare disease, epidemolysis bullosa, but if the patient had had that condition, other traumatic lesions would have appeared before the present attack or subsequent to it. The traumatic element described probably had nothing to do with the appearance of the outbreak. The cases would suggest several diseases which were at times bullous, impetigo contagiosa, urticaria, erythema multiforme, or even beginning cheiropompholyx. With the limited distribution and unusual history, the classification was extremely difficult.

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CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. HENRY HEIMAN. DR. M. NICOLL, JR.
DR. C. D. MARTINETTI. DR. CHARLES OGILVY.
DR. S. W. THURBER.

DISEASES OF THE EAR, NOSE AND THROAT.

ALLPORT, FRANK: SOME INTERESTING MASTOID CASES WHICH HAVE COME UNDER MY OBSERVATION DURING THE PAST YEAR. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 68.)

This article is a recital of 13 cases, among which Case IV., a child aged four, was operated upon for acute mastoid abscess in June, 1906. Discharged cured in about six weeks. Two years afterward he appeared with fistulous canal into the antrum. Local treatment had no apparent effect until a staphylococcic autovaccine was used, when the sinus healed up in two weeks.

CASE VI. Boy of six years, first seen April, 1908. Very large tonsils and adenoids were removed. The boy had been exposed to measles and came down with them in two days after the operation. Both ears began to discharge at the end of a week, and in seven days more it was necessary to operate on his right mastoid. Considerable necrosis and pus were found. He developed great tenderness along the course of the jugular vein and had a white blood-cell count of 10,000, with 84 per cent. polymorphonuclear cells. However, this high percentage diminished and he finally made a good recovery without a further operation. This case teaches not to be in too great haste to extend a mastoid operation by opening the sinuses.

CASE VII. K. R., aged eight. The application of chromic acid to granulations following a mastoid operation produced a facial paralysis, which was recovered from in a month. The use of strong caustics is, therefore, to be avoided in a mastoid wound.

CASE XIII. Boy aged twelve. He was taken ill with grippe in February, 1908, and apparently recovered in a few days. In three weeks he was suffering from earache on both sides and shortly both ears began to discharge. On the twenty-second of March he began to have chills each day, but the ears had ceased discharging though he had pain in the right ear. On March 20th he developed pain over both frontal sinuses radiating to back of head and his eyes were closed by edema of lids. The usual mastoid symptoms were absent and nothing was found by an exploratory frontal sinus opening. The right mastoid was then opened and some necrosis and very little pus found. Highest temperatude was 103° ; white blood count, 16,000, with 87 per cent. polymorphonuclear cells. As he did not improve, the left mastoid was opened and pus and necrosis found. He continued to have chills and temperature, and on April 3d the right sigmoid sinus was opened and a small streptococcus thrombus forced out, after which he made a good recovery in a few weeks.

Cases like this show that even though there is no redness, swelling, or pain over the mastoid process and no abnormal appearance to the drum membrane, a serious infection may be going on inside the bone. The blood count was a help in this case.

S. W. THURBER.

MASSEI, F.: GIANT TUMORS OF THE LARYNX. (*Annals of Otology, Rhinology and Laryngology,* December, 1909, p. 931.)

Among 10 cases cited, 1 occurred in a girl of four years, where examination of the larynx revealed a large cauliflower-like mass, the size of a nut, pale-red in color and of irregular shape, which appeared posteriorly covering the arytenoids. On account of dyspnea intubation was done and parts of the growth removed by the natural passages. On further study of the growth some was seen in the trachea and a tracheotomy was done and parts of the growth also removed through this wound. The following conclusions were drawn:—

(1) Certain tumors of the larynx, of good or bad nature, sometimes attain considerable volume and can be called giant tumors.

(2) The exaggerated dimensions of these tumors may be the result of a transitory phase which, in spite of their benignity, constitute a vital danger.

(3) The large dimensions do not always permit recognizing the point of origin.

(4) The physical characters of giant tumors do not always indicate their nature, so that a microscopic examination is necessary.

(5) They have a two-fold interest; their volume, which offers immediate danger, and their possibility of being malignant.

(6) Local treatment by the natural route is indispensable.

S. W. THURBER.

SMITH, S. MACCUEN: EXHIBITION OF CASES, ILLUSTRATING THE RESULTS OF THE SO-CALLED HEATH OPERATION. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 29.)

The Heath operation consists in removing all the diseased cells and bone in the temporal bone, as in any radical mastoid operation, with the exception of the tympanic ring and the fragments of the ossicles and tympanic membrane, which are left undisturbed, as it has been claimed that the extent of their necrotic involvement makes but little difference in the final result. The principle here is that the mastoid antrum is more frequently the seat of continuous suppuration than the cavity of the middle ear. The author looks to see this operation supplant the excision of the ossicles for the cure of otorrhea. This operation should be the one of choice where it is necessary to operate on a child, for as it preserves the hearing, the danger of deaf-mutism is avoided. In this operation there is very little danger of injury to the facial nerve, and the antral disease being eradicated cerebral lesions are not apt to follow.

An account of 5 cases, all over eleven years of age, is appended in the original article. S. W. THURBER.

WOOD, GEO. B.: A FEW THOUGHTS CONCERNING THE PATHOLOGY OF ACUTE TONSILLITIS. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 1.)

The author deals with that type which is associated with swelling, soreness, congestion and purulent exudate. There is no specific germ, but in the severe forms streptococcus is found, while a large amount of exudate is generally due to the two common forms of staphylococcus. The pneumococcus is found in about 5 per cent. of cases and the bacillus coli communis occasionally. The tissue irritant, which produces the tonsillar inflammation, is the result of bacterial life. The cryptic epithelium is necessarily the first point of attack, and this leads to a proliferation of the cells. As long as the epithelial cells retain their vitality, it is doubtful whether the bacteria can infect the parenchyma; but the toxins usually soon destroy the epithelial cells and the tonsillar tissue is soon full of germs. Lymphadenitis is produced by their presence in the lymph channels.

The phagocytic cells found in acute tonsillitis are probably derived from the polymorphonuclear leukocytes.

In closing, the author states that though there are three forms that can be recognized pathologically, it is possible to define but two clinically, *i.e.*, simple proliferative, where the tonsils are red and swollen, and suppurative, where the tonsil shows an exudate of some sort. S. W. THURBER.

DISEASES OF THE SKIN.

AUDRY, C. H.: ERYTHRODERMA OF NURSLINGS. (*La Pathologie Infantile,* January 15, 1909, p. 9.)

An account of a case of the disease regarded as a clinical entity and first described by C. Leiner (*Archiv. für Dermatol. und Syphil.,* T. LIX., H. I. and II., pp. 65 and 103) who observed 43 cases. According to the writer, it has usually been classed among the eczemas. A minute description is given. The only dermatoses with which it should be confounded are certain varieties of seborrheas (Pityriasis Rubra Seborrhoica of Unna). But in the latter the disease starts from the scalp. There is infiltration and finer scaling. The lower limbs are usually not involved, the hands always free. As to eczema, psoriasis, etc., there should be no confusion between those and the disease in question. In the latter there is an absence of pruritus, exudation, papules and of infiltration. Leiner states that the disease runs a course of several months and ends fatally in a third of all the cases from cachexia, syncope, etc. M. NICOLL, JR.

PATHOLOGY.

JOVANE, A., AND PACE, C.: SUPRARENAL CAPSULES AND RACHITIS. (*La Pediatria,* March, 1909.)

The object of this paper is to study the relationship of the suprarenal capsules with rickets. The following interesting conclusions were reached:—

(1) Injections of 1:1,000 solution of adrenalin in rachitic children gave decidedly good results, possibly through stimulating metabolism.

(2) Contrary to what appears in children, the capsules of deformed rabbits do not show any appreciable alteration.

(3) Bilateral capsulectomy in young dogs is almost always fatal, therefore the suprarenals would seem to be essential to life at an early age.

(4) Unilateral capsulectomy after two months does not give histologic alterations in the bony tissues.

(5) From an anatomic and pathologic point of view, the authors conclude no relation exists between the suprarenal capsules and rachitis. C. D. MARTINETTI.

VALAGUSSA, FRANCESCO: ON THE RESISTANCE OF THE DIPHTHERITIC BACILLUS TO DESICCATION. (*Riv. di Clinica Ped.,* April, 1909.)

In the course of a series of experiments Valagussa has had occasion to repeatedly completely desiccate cultures of Löffler's bacillus, both by heat and by chemical means. He has found that without doubt the bacilli were still virulent after twenty-six months. This fact should have great importance for prophylactic considerations, as the insufficiency of all ordinary disinfection is demonstrated. C. D. MARTINETTI.

CALMETTE, A., AND GUERIN, C.: ON CERTAIN PROPERTIES OF THE TUBERCLE BACILLUS GROWN ON BILE. (*L'Echo Médicale du Nord,* January 3, 1909, p. 1.)

It has been shown that in order to infect animals surely through the digestive tract the bacilli should be finely divided and emulsified in a mucilaginous liquid, a fact which explains the constancy and gravity of the infection seen in calves following the ingestion of tuberculous milk.

Experiments have shown that cultures introduced by the digestive tract are absorbed and resorbed more readily than when introduced subcutaneously or intravenously.

Bovine tubercle bacilli grown on bovine bile are readily absorbed through the digestive tract and create lesions which tend to rapid calcification, a process never observed in experimental inoculation of cultures grown in the ordinary way. Injected intravenously into bovines it produces a general febrile disease without the formation of tubercles (typho-bacillosis—Landouzy).

Human bacilli grow with great difficulty on bovine bile, and the bacilli of birds not at all. On the contrary, both of these types grow luxuriantly on human bile and that of the chicken. The authors suggest cultivation on bile as a means of differentiation between the three types of bacilli. M. Nicoll, Jr.

Gellé, E., and Leclercq, M. J.: The Pancreas in Hereditary Syphilis. (*L'Echo Médicale du Nord,* November, 1908, p. 525.)

An extensive review of the literature of this subject with personal observations of the writer illustrated.

The pancreas is involved less frequently than the spleen, liver, bones and lungs; somewhat more frequently than the thymus, heart, intestines and kidneys. The lesions may be divided into two classes: (1) An extensive growth of new connective tissue of very characteristic appearance, but without gummata. (2) A sclerosis with gummata. Of these the first is the more frequently seen.

The writers believe that there is both a hypoplasia (arrested development of glandular elements, together with their destruction, through the growth of new tissue). M. Nicoll, Jr.

ORTHOPEDIC SURGERY.

Ménard, Le Moine, Pinard: A Contribution to the Clinical Study and Radiography of Hereditary Syphilis of the Long Bones. (*Gaz. des Hôpitaux,* 1908, No. 48, p. 51.)

The writers report on observations made on over 20 cases, of which the greater number were children from two to fourteen years of age. Of these the bones were involved as follows:—

Twenty-four times the tibia, ten times the ulna, six times the femur, five times the humerus, four times the radius, four times the fibula.

In contrast to tuberculosis, syphilis results in an overproduction of bone, which clinically is especially marked at the diaphyses. Pathologic anatomy shows that it may have its origin alone there (sixteen times), as well as also alone at the epiphysis (eight times). Usually both sections of the bone are attacked without transition (twenty-two times). The line of the epiphysis may give no resistance to the syphilis, as it may in tuberculosis. Syphilis of the tibia shows itself typically in the sabre sheath form. The white, smooth bone surface and straight edge is always marked, yet the bones remain straight, which the X-rays show. The bone may grow not only in thickness, but also in length (to 4 cm.), whereby deformities may result, such as club hand. Commonly are the nose, cranium, palate involved. The development of the pathologic changes occurs spasmodically. Hyperostoses may dissolve under mercury and gummata be reabsorbed. Sometimes spontaneous cures may take place, and sometimes after a number of years of apparent cure the disease will reappear.

Of special importance and instruction are X-ray pictures taken at different stages of the disease. CHARLES OGILVY.

SURGERY.

BROCA, A.: TREATMENT OF INGUINAL HERNIA IN THE NEW-BORN. (*La Pathol. Infant.*, November 15, 1908, p. 241.)

Children up to the age of a year or even eighteen months, in cases of backward physical development, are included as presenting conditions predisposing to this condition. Among the causes are rachitis, malformations of the peritoneum and prematurity. Heredity, especially on the paternal side, is a noteworthy factor. Many children are born with the hernia already formed, frequently containing the large intestine, a peculiarity of infants and the aged. Many of the hernias, however, appear later, the process being completed by the mechanical effort of coughing, crying, etc. In a number of cases the cure is spontaneous, or is effected by the use of an ordinary supporting bandage. Ill-nourished and rachitic children exhibit no such tendency, the condition remaining the same or becoming more aggravated. In such cases the restlessness and constant crying of the child tend to aggravate the hernia, which is itself one of the causes of colic and discomfort. The vicious circle, thus established, renders prognosis unfavorable. The involved intestine frequently becomes the seat of impacted feces. Strangulation in children under one year is more common than later. In an infant in the second year the writer prefers the radical operation. Younger children should be treated with a bandage. The statistics of operative cases show very favorable results. M. NICOLL, JR.

MEDICINE.

HERRGOTT, H.: ERYSIPELAS IN THE NEWBORN. (*La Pathologie Infantile,* July 15, 1908, p. 145.

The disease is now very rare, but of extreme gravity. In the first of 2 cases described by the writer infection was through the umbilicus, the patient succumbing nine days later from general purulent peritonitis. The second case occurred on the eighth day of life, the point of infection being the margin of the vulva, the disease spreading upward and causing death from general infection, including involvement of the peritoneum in four days.

The pathology and bacteriology and probable cause of the fatality of the disease in children is fully set forth.

M. NICOLL, JR.

UNGAR, E.: PULMONARY ATELECTASIS. (*Jahrb. für Kinderhk.,* May 5, 1909, p. 505.)

The author takes issue with the views concerning atelectasis recently expressed by Peiser. Ungar supports the commonly-accepted view that atelectasis in the newborn is due either to primary failure of lung expansion or to partial reabsorption of air from the alveoli. In normal infants, the first respiratory efforts bring air into practically all the alveoli simultaneously. Acquired atelectasis is not brought about by pressure on the alveoli, but by absorption of the air from the alveoli, where a fresh supply from the bronchi is not obtainable. This condition obtains when the lungs are in extreme expiratory state for a considerable period of time, for then the smaller bronchi become collapsed, and an exchange of air becomes impossible.

HENRY HEIMAN.

BERNHEIM-KARRER: PYLORIC STENOSIS IN INFANCY AND CHILDHOOD. (*Jahrb. für Kinderhk.,* May 5, 1909, p. 551.)

In 8 cases repeated gastric examinations showed the existence of definite motor insufficiency associated with more or less hyperacidity, even as late as the second or third year of life. These patients were thriving, and no longer suffered from vomiting or constipation. The vomiting, constipation and visible peristalsis are therefore probably due to pyloric spasm. When this is relieved the clinical symptoms disappear, yet the stenosis persists. Pyloric stenosis is always primarily due to hypertrophy of the pylorus. Pyloric spasm even of prolonged duration does not produce hypertrophy of the pyloric muscle. HENRY HEIMAN.

GAEHLINGER, M. H.: CONTRIBUTION TO THE STUDY OF INFANTILE DISSEMINATED SCLEROSIS (SCLÉROSE EN PLAQUES). (*L'Echo Médical du Nord,* January 24, 1909, p. 37, and January 31, 1909, p. 49.)

Up to a very recent date the disease was regarded as peculiar to adults. Charcot described the first case in a child of fourteen years.

Age.—The disease may exist at birth, but is not marked until the seventh year; sex is without influence. Certain writers regard heredity as a causative factor, but the most frequent causes are the infectious diseases—syphilis, typhoid fever, small-pox, erysipelas, scarlet fever, diphtheria, measles.

Symptoms.—The mode of onset may be slow or sudden. In most cases the infection takes place in a progressive and insidious manner, in others more rarely the disease begins suddenly with convulsions or with an epileptic or apoplectic form of attack. The latter mode of onset, however, resembles more closely an acute myelitis. The symptoms are in general those seen in adults. A common one is weakness in the lower limbs and difficulty in walking, which may compel the patient to stay in bed. There may be disturbances of sensibility, or even complete anesthesia of the lower limbs and the lower half of the abdomen, or a hyperalgesia; darting or continuous pains are noted by some observers. Defects of vision are also seen, even to atrophy of the optic nerve. The progress of the disease is generally slow and lasts from two to ten years, the symptoms varying in intensity. In certain doubtful cases the progress is rapid.

Diagnosis.—This is difficult on account of the age of the patient. The disease must be differentiated from cerebrodiplegia (Friedreich's disease), spasmodic paraplegia, etc. Also from chorea, spasmodic tabes (Little's disease) and cerebrosclerosis, cerebral tumors, syphilitic disseminated sclerosis, hysteria, and acute encephalomyelitis.

Eighty-six observations of cases taken from the literature are discussed by the writer. M. NICOLL, JR.

MICHELIN, D. E.: POST-DIPHTHERITIC CARDIAC DEATH. (*St. Petersburg. Med. Woch.*, January 24, 1909, p. 50.)

The heart must be protected during convalescence from diphtheria, cardiac depressants being especially guarded against. The diet should be strengthening and stimulating. Death from this cause is regarded as of more frequent occurrence than before the use of antitoxin, because more weak patients survive the original disease. M. NICOLL, JR.

HYGIENE.

MILLON, R:. TREATMENT OF PREMATURE INFANTS. (*La Pathol. Infant.*, November 15, 1908, p. 241.)

The three rules formulated by Budin are indispensable to success, namely, protection against cold, suitable nourishment, and protection against infection. The cases are divided into two classes—the well-nourished and the ill-nourished—determined not by age, which is difficult to arrive at, but by body weight. The first includes those weighing between 1,000 and 2,500 grams; the second, those weighing over 5 pounds. The first class are under eight months and show various evidences of lack of development not seen in the second. Recent statistics in the Paris Charity Hospital show in infants weighing under 1,500 grams a survival of 36 per cent., and in those from 1,500 to 2,000 grams 73 per cent., from 2,000 to 2,500 grams 94 per cent. The statistics taken over a period of ten years in regard to the subsequent history of these cases, according to Budin, show that 93.4 per cent. survive.

M. NICOLL, JR.

SIMONINI, R.: CAUSES OF MORBIDITY AND MORTALITY IN INFANCY. (*La Pediatria,* March, 1909.)

After long and patient researches regarding the causes of sickness and death in children of women employed in cigar factories, Simonini reaches the following conclusions:—

(1) Both morbidity and mortality in such children are superior to the average.

(2) Faulty and irregular nursing and premature artificial feeding appear to be responsible for such ailments as dyspepsia, enteritis, eczema and rickets in infancy.

(3) Breast-fed infants receive on the average less plentiful feedings than normal.

(4) The presence of nicotine in the mother's milk is not demonstrated.

(5) The reactions, chemical compositions and ferments of the milk of cigar workers appear unaltered.

(6) The hemolytic properties of the milk remain sufficiently high.

C. D. MARTINETTI.

THERAPEUTICS.

BECK, C.: TREATMENT OF CHOLERA INFANTUM WITH CARROT SOUP. (*Jahrb. für Kinderhk.,* May 5, 1909, p. 516.)

In acute gastrointestinal disturbances the great loss of fluids from the body is a direct menace to life. The introduction of salt, either by mouth or subcutaneously, leads to retention of water and is therefore of great therapeutic value in these cases. Many infants, however, will persistently refuse to take salt solution even when the salty taste is somewhat disguised by the addition of bicarbonate of soda. For some time the author has administered in these cases a carrot soup with very gratifying results. It is prepared as follows: A pound of carrots is cut up into small pieces and boiled in water for one to two hours; this is then strained through a fine sieve into a liter of bouillon made from a pound of beef. To this is added a teaspoonful of table salt. A liter of this soup has a caloric value of 250. This soup was readily taken and retained by all infants even when all other food was rejected. Large quantities—200-300 c.c.—were given at intervals of three to four hours.

The severe symptoms of collapse usually disappeared within one to three days, the temperature dropped and the weight increased. The stools became pultaceous, of reddish-yellowish color, and the odor disappeared. With the exception of a few Gram negative bacteria all micro-organisms disappeared from the stools. It is the author's opinion that, used at the proper time, carrot soup will prove a good substitute for salt infusion in cholera infantum. HENRY HEIMAN.

FRANCHETTI, U.: THE USE OF STROPHANTIN IN PEDIATRICS. (*Riv. di Clinicà Pediatrica,* April, 1909.)

Franchetti has employed strophantin hypodermically in a number of cases with the following results: The alkaloid did not give lasting and satisfactory results in asthenic conditions of the heart following diphtheria. In chronic cases the results were very similar. The quantity of the drug employed (½ to 1 mg.) invariably produced toxic effects, principally a disordered pulse of a peculiar character. Injections, both hypodermic and intraveneal, produce a considerable amount of local reaction. In conclusion the good results ascribed to strophantin in adults do not appear to take place in children. C. D. MARTINETTI.

BOOK REVIEWS.

DES KINDES ERNÄHRUNG, ERNÄHRUNGSSTÖRUNGEN UND ERNÄHRUNGSTHERAPIE. By AD. CZERNY, Breslau, and A. KELLER, Berlin. Seventh Section. Leipsic: Franz Deuticke, 1909.

The seventh division of Czerny's and Keller's book comprises five chapters and deals with disturbances of digestion due to infection (Ernährungsstörungen ex infectione). These they divide into alimentäre toxicose, enterale infection and parenterale infection. By alimentäre toxicose is meant a disturbance caused by food which has been decomposed by bacteria either before or after its ingestion; by enterale infection the symptoms of disease produced by pathogenic organisms either in, or obtaining entrance through the intestinal tract, and by parenterale infection those disturbances of nutrition produced as a result of infection elsewhere in the body.

Czerny and Keller combine, under the title "Toxicose," those cases that have been described under a variety of names, such as gastroenteritis, enteritis follicularis, acute intestinal intoxication, enterocatarrh, etc. They do this as they insist that there is no proof that bacterial toxins are responsible for the symptoms and that there is no reason for considering them as necessarily present, since almost all the symptoms may be the immediate result of disturbances in intermediary metabolism. The symptoms are due, according to Czerny and Keller, partly to the loss of water and salts, partly to the absorption of substances which under normal conditions would not pass the intestinal wall, and partly to the acidosis. This teaching is greatly at variance with the ideas usually held and will encounter much opposition in this country.

Czerny and Keller regard as not proven the association of bacilli of the dysentery and colon bacillus group with intestinal disease, except with dysentery, which is frankly so from a clinical and pathologic standpoint. They refuse to separate cases into groups upon symptomatic or pathologic grounds, and consider all, from the mild diarrhea to the most severe cholera infantum, as belonging to the same class, differing only in degree.

Whatever the difference of opinion in regard to these views may be, there can be no doubt that much clarity is gained by such a general consideration, elaborate classifications differing with each author are avoided and the indications for, and methods of, treatment can be more comprehensively considered without frequent repetition.

Under "Enterale Infection" Czerny and Keller discuss those conditions due to pathogenic organisms in the intestinal tract. The first part of this chapter is devoted to stating the reasons why they do not believe that gastrointestinal disturbances are due to specific organisms, although they admit that there is no positive proof that such may not be the case. Two conditions they believe are due to infection through the intestines—icterus neonatorum and infection of the newborn—though they are able to bring no positive proof. Here, again, their views are in opposition to those usually held.

Under "Parenterale Infection" are discussed the disturbances of nutrition that may be secondary to various infections and the methods to be pursued in shielding children in homes, institutions and hospitals from such infections.

A chapter on the pathologic anatomy of disturbances of nutrition, in which is especially pointed out the lack of agreement between the severity of symptoms and the lesions found brings this part of the work to a close. It can be as warmly recommended to pediatrists as those portions which have preceded it.

JOHN HOWLAND.

ANGINA PECTORIS. PART III. OF CLINICAL TREATISES ON THE SYMPTOMATOLOGY AND DIAGNOSIS OF DISORDERS OF RESPIRATION AND CIRCULATION. By PROFESSOR EDMUND VON NEUSSER, M.D., of the Second Medical Clinic, Vienna. Authorized English Translation by ANDREW MACFARLANE, M.D., Professor of Medical Jurisprudence and Physical Diagnosis, Albany Medical College. Pp. 71. New York: E. B. Treat & Co., 1909.

As Dr. MacFarlane has remarked in his preface, this little monograph is a medical classic. Professor von Neusser has expressed his views compactly and clearly on the subject of this symptom-complex, so interesting from the point of view of the distinguished men who have succumbed to it, from the theories of its origin, and from its startling clinical picture. The diagnosis, differential diagnosis, etiology and theory are gone into in detail, and functional forms of angina are considered. A brief exposition of the therapy closes the work.

TREATMENT OF THE DISEASES OF CHILDREN. By CHARLES GILMORE KERLEY, M.D., Professor of the Diseases of Children in the New York Polyclinic Medical School and Hospital. Second edition. Revised. Pp. 629. Philadelphia: W. B. Saunders Company, 1909.

The issue of a second edition of Dr. Kerley's admirable work in less than two years after its initial appearance, shows that it has been appreciated by the profession. The new edition has been revised and somewhat rearranged, and about forty pages of material added. To the chapter on feeding have been added articles on malt soup feeding, in which the author has obtained very satisfactory results in selected cases, and on the caloric method which Dr. Kerley has not found to correspond to the obvious requirements of many of his children. The chapter on vaccine therapy presents the present status of treatment by this means among children; while the serum treatment of cerebrospinal meningitis is given in detail. The treatment of other diseases has been elaborated and the new edition shows a commendable effort to maintain the already high standard which the book has attained. It should, therefore, be of greater value to the physician than even the first edition, which has so conclusively proved its usefulness.

MARRIAGE AND DISEASE, BEING AN ABRIDGED EDITION OF "HEALTH AND DISEASE IN RELATION TO MARRIAGE AND THE MARRIED STATE." Edited by PROFESSOR H. SENATOR AND DR. S. KAMINER. Translated from the German by J. DULBERG, M.D., Manchester, England. Pp. 452. New York: Paul B. Hoeber, 1909.

This abridged edition of Senator and Kaminer's exhaustive treatise is in itself a book of some size and contains much material of interest to the physician and to the layman. Marriage and the married state are treated from many points of view, hygienic, social, sanitary, ethnological and climatological. The relation of different diseases to marriage is taken up in great detail, a chapter being given to each group of diseases, and admirable expositions appear of the danger of syphilitic and gonorrheal infections. The book will serve well as a work of casual reference for the physician and will help him to solve many of the perplexities which beset the layman. For the physician who wishes to go further into detail it will stimulate recourse to the larger treatise.

CARROT SOUP FOR INFANTS.—For infants suffering from acute or chronic intestinal disturbances, E. Moro highly recommends a soup prepared as follows: Five hundred grams carrots are peeled, mashed and boiled out with water, until 375 grams remain behind. The mass is then rubbed through a very fine sieve and added together with 6 gm. of salt to 1 liter of broth. This soup was given to infants from two weeks to six months old, with the best results. In acute cases, the vomiting and diarrhea will cease in from one to three days and the fever and general symptoms of marasmus will rapidly disappear. In the chronic affection and in infants suffering from atrophy, the result is no less prompt, and a rapid gain in weight can be noted. The stools are soft, very copious, and yellow or reddish-yellow. One of the most pronounced results following feeding with carrot soup is retention of water within the system of the infant.—*Muench. Med. Woch.*

THE TREATMENT OF NASOPHARYNGEAL CATARRH IN CHILDREN. Hecht (*Therapeut. Monatsch.*, August, 1908). The author observed that very severe convulsive attacks of coughing originate reflexly by way of the nasopharynx affected by catarrh. During the night especially, with the patient in the recumbent position, the secretion runs down at the posterior surface of the pharynx and determines the reflex at the larynx. This occurrence is especially frequent in measles. The best remedy consists in instillations, at first every three hours, then three times daily, of a sozojodal-zinc solution (½ per cent.) into the nose. This treatment is prescribed by the author in measles as soon as a severe coryza makes its appearance. Used prophylactically in this manner, it serves not only to prevent the irritative cough, but guards against the development of middle-ear inflammations.—*Medical Review of Reviews.*

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ORIGINAL COMMUNICATIONS.

THE URINE IN THE GASTROINTESTINAL DISEASES OF INFANCY. AN ANALYSIS OF THE RESULTS OF THE EXAMINATION OF THE URINE IN THREE HUNDRED CASES.*

BY JOHN LOVETT MORSE, A.M., M.D.,

Assistant Professor of Pediatrics, Harvard Medical School; Associate Visiting Physician at the Children's and Infants' Hospital; Visiting Physician at the Floating Hospital, Boston.

AND

BRONSON CROTHERS, A.B.

These babies were patients on Dr. Morse's services at the Infants' Hospital and Floating Hospital. They were consecutive, except that in many instances, especially at the Floating Hospital, the urine for one reason or another was not examined. In most instances but one examination was made. In many, however, especially if anything was found wrong at the first examination, repeated tests were made. The examination was usually made within the first forty-eight hours after entrance to the hospital. The test for albumin was made either with cold nitric acid or with acetic acid and heat, sometimes with both. The sediment was usually not examined unless albumin was found. Unfortunately it was sometimes not examined even when there was albumin. The writers realize that examinations made in this routine way, and not repeated, do not justify any very definite conclusions. It seemed to them, however, that, on account of the large number of babies studied, even such incomplete methods ought to give a general idea as to the frequency of albuminuria and renal complications in these diseases. They also hoped that they would give some idea as to the importance of the urinary findings in prognosis and that they might show something as to the relation between some of the other symptoms, such as stupor, restlessness and edema, and the urinary findings. The subject has been taken up entirely from the clinical side, as autopsies were so few and so incomplete that they showed nothing as to the pathologic conditions in the kidneys.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 28, 1909.

The literature of this subject is fairly voluminous and was reviewed by one of us (Morse) in papers published in 1899 and 1902. Koplik's paper, published in 1899, as well as several of those published since 1902, are, however, worthy of special consideration in this connection.

Koplik found evidences of inflammation of the kidneys in 21 of 25 consecutive cases of acute or subacute gastroenteritis in infants. He believes that a renal complication adds certain distinctive symptoms to the picture of the disease, and does not agree with the French writers who claim that they have no characteristic symptoms. He thinks that the symptoms from a complicating nephritis can be divided into two classes—the first general and inseparable from the primary disease, the second directly traceable to the affection of the kidneys. In the milder cases there are usually no symptoms; in the severer forms there is often marked restlessness, sometimes alternating with periods of stupor. He believes that persistent vomiting, which is not relieved by one or two irrigations of the stomach, is due to a disturbance of the function of the kidneys and a manifestation of uremia rather than of toxemia. He also believes that the edema sometimes seen in these cases, most often in the lower extremities, is due to trouble in the kidneys. He feels very strongly that these symptoms, which have usually been attributed to toxemia rather than to uremia, are uremic and not toxic. He believes that the lethal ending is hastened by the renal complication, but thinks that with proper treatment the prognosis is in general good.

Hohlfeld studied very carefully the urine of 40 babies suffering from various diseases of the gastroenteric tract. Five of these had chronic gastrointestinal catarrh, 3 of whom died. A trace of albumin was found in 4; the sediment was slight, but contained casts and cells and very rarely blood. Sixteen had chronic catarrh of the colon and all died. He found albumin in the majority all of the time. The sediment varied with the amount of albumin; as a rule, there was considerable, its composition being the same as in the cases of chronic gastrointestinal catarrh. He often found casts when there was no albumin. Sixteen had acute catarrh of the colon, 13 of whom died. He found albumin in all but one. This one died in twenty-four hours, only one examination of the urine having been made. The sediment in these cases was macroscopically slight, but microscopically very rich. It contained very many hyalin casts, but few of other varieties, numerous cells and leukocytes and very little blood. Three had cholera infantum, all of whom died. The urine contained much albumin. The sediment was abundant, the casts more varied than in the cases of catarrh of the colon, and the sediment showed more fat and very little blood. He also believes that the restlessness, stupor and vomiting in these cases are symptoms of uremia, but admits that they may also be explained by the toxemia, the feeble circulation and the loss of fluid. He had autopsies in 35 cases. The changes found in the kidneys were mainly of the parenchymatous type; no case showed a pure interstitial nephritis. In 2 cases a peculiar condition of infarction dominated the picture and once there was a thrombosis of a renal vein and a hemorrhagic infarction of a whole kidney. The pathologic changes seen in these cases were those ordinarily found in intoxications and infections, both of which conditions are present. They must be due to the absorption of toxic substances from the intestine, because bacteria are not found in the kidney. He believes that the disturbance of the eliminative function of the kidneys and the formation of toxic substances in the gastrointestinal tract react on each other and render the prognosis unfavorable. It is not absolutely bad, however, as some get well. A resulting chronic nephritis is possible, but not probable. He thinks that salt solution given subcutaneously is the best treatment for the renal complications.

Pick carefully examined the urine of 36 babies ill with various diseases of the gastroenteric tract. He found albumin and casts in the urine of 2 cases of dyspepsia and in 3 of acute intestinal catarrh. The sediment in one of the latter contained red corpuscles. One of them had edema; none showed nervous symptoms. One of each class died; 1 of the dyspeptic cases was discharged unrelieved; the other 2 recovered. He found albumin in varying amounts in most of 23 cases of cholera infantum. The sediment always contained casts, sometimes blood and occasionally bacteria. He found casts even when there was no albumin. There was edema in some cases and not in others. The amount of edema had no relation to the presence or absence of albumin. He was unable to determine whether the nervous symptoms were due to uremia, toxemia, or enfeebled circulation. Fourteen died, 7 were discharged unrelieved and 2 recovered. The kidneys showed congestion, fatty degeneration of the epithelium of the straight and convoluted tubules, local necroses of the epithelium of the convoluted tubules and foci of recent interstitial inflammation in the cortex. Four cases of subacute intestinal catarrh all showed a great deal of albumin, many casts, fat and so on. They had edema, but no other symptoms of uremia. Three died and 1 recovered. The worst one recovered and the urine was normal four and one-half months later. The urine of the 4 cases of chronic intestinal catarrh never showed much albumin, seldom casts and never blood. None of them had uremic symptoms. Three died and 1 recovered. There was marked fatty degeneration of the epithelium of the convoluted and straight tubules. The glomeruli were normal and there were no interstitial changes. The symptoms of nephritis were slight in all these cases. He believes that the edema in these cases may or may not be due to nephritis; that the symptoms which are often thought to be uremic may be due to toxemia or disturbance of the circulation and that toxemia is the most important cause of the nervous symptoms.

Chapin examined the urine of 86 babies suffering from various gastroenteric disturbances. He found albumin in 75; a faint trace in 31, a trace in 29, and a heavy trace in 15. Casts of various sorts, hyalin, granular, epithelial and mucous, were found in 37. Sixteen died, 14 of whom had albuminuria and 10 casts as well.

Knox and Meakins examined the urine of 53 babies ill with diarrheal diseases. Thirty-three had dyspepsia or fermental diarrhea, and 20 ileocolitis, the division being based on the character of the dejections. The urine was abnormal in 22. The urine contained albumin alone in 2 and albumin and hyalin casts in 5, a finding which they believe indicates cloudy swelling of the kidneys. It contained pus alone in 2 and pus and albumin in 5, a finding which they consider characteristic of pyelitis. It contained pus, albumin and casts in 4; pus, albumin, casts and many bacteria in 2; pus, albumin, casts and red blood cells in 2, a finding which they consider represents nephritis or pyelonephritis. The urine was abnormal in 30 per cent. of the cases with dyspeptic diarrhea and 60 per cent. of those with ileocolitis. The number of cases with albuminuria, pyelitis and nephritis was essentially the same in both classes, the affection of the kidneys being about as severe in one class as in the other. Twenty-seven per cent. of those in which the urine was abnormal died or were discharged unimproved, as compared with 19 per cent. of those in which the urine was normal; that is, the general result was better in the cases in which the urine was normal. They cite 2 cases in which the urinary abnormalities did not hinder recovery, and one in which the urinary complication was the chief ailment.

The classification of the diseases of the gastroenteric tract used in this paper is that adopted by the Pediatric Department of the Harvard Medical School. (See Rotch, Archives of Pediatrics, 1906, Vol. XXIII., p. 881.) The urine of 300 babies, as already stated, was examined.

Regulation of Feeding.—In 39 cases the disturbances of the gastroenteric tract were not very marked, so that no more definite diagnosis than regulation of feeding was made. All of these babies were under one year old and were discharged well. A slight trace of albumin was found in one. The sediment in this case showed nothing abnormal.

Chronic Gastric Indigestion.—Albumin was found in the urine of but 2, or 4 per cent., of 53 cases. Five, or 10 per cent., of those in which there was no albumin died. The 2 whose urine contained albumin were discharged relieved. In 1 the urine was high, acid, and contained a very slight trace of albumin. The sediment was not examined. Three days later the urine contained no albumin. In the other the urine was slightly turbid, acid, and contained a slight trace of albumin. The sediment was not examined. One baby whose urine did not contain albumin one and five days before death became markedly edematous during the last twenty-four hours. The temperature was practically normal in all the cases. Vomiting was, of course, a common symptom.

Chronic Intestinal Indigestion.—The urine of 7, or 11 per cent., of 61 babies ill with chronic intestinal indigestion contained albumin; 11, or 20 per cent., of the babies whose urine did not contain albumin died, compared with 2, or 28 per cent., of those whose urine contained albumin. The following table shows the important characteristics of the urine and the final results in the individual cases:—

TABLE I.

No.	Color	Reaction	Sp. Gr.	Albumin	Sediment	Result
1	Pale, turbid	......	....	Slight possible trace. Three subsequent examinations; 3, 4 and 5 weeks later showed nothing abnormal.	Numerous red corpuscles; occasional leukocyte and round cell; no casis	Relieved
2	Slight, turbid	Acid	1020	Slight trace	Numerous neck of bladder cells; few leukocytes; no red cells or casts	Not relieved. A. A.
3	Pale, turbid	Acid	1007	Slight trace	Numerous large and small round cells; no casts	Not relieved. A. A.
4	Pale, turbid	......	....	Slight trace	Occasional red cell, round cell, leukocyte and granular cast	Relieved
5	Pale	Acid	....	Slight trace	No real elements	Relieved
6	Normal, cloudy	Acid+	....	Trace	No cells or casts; urates +	Dead, 1 day
7	Clear	Acid	1020	Trace	Not examined	Dead, 2 days

The temperature of all the babies was practically always normal, whether the urine did or did not contain albumin. Repeated examinations were made in some instances both when there was and was not fever, but albumin was never found. In others in whom albumin was never found the examinations were repeated many times over periods of several months. There was no vomiting at the time of or immediately preceding the examination in 65 per cent. of the babies without albuminuria and in 71 per cent. of those with albuminuria. The facts that albumin was always absent in some instances when the amount of vomiting varied materially from time to time and that it was always absent in others, both when there was and was not vomiting, show that there was no connection between the vomiting and the presence or absence of albumin in the urine. One of the babies with albuminuria developed edema of the feet and hands three days after entrance. The urine showed only a slight trace of albumin and the sediment contained no red cells or casts, merely caudate cells and a few leukocytes. There was, therefore, apparently no connection between the albuminuria and the edema, which was much more easily explained by the generally miserable condition of the baby.

Acute Gastric Indigestion.—Albuminuria was found in 3, or 18 per cent., of 17 babies ill with acute gastric indigestion. There was the slightest possible trace in 1, and a slight trace in the others. The sediment was not examined in 2 and contained only urates in the other. The temperature was more or less elevated in those in which albuminuria was found, and varied between normal and 105°F. in those in which albumin was not found. All the babies recovered.

Acute Intestinal Indigestion.—Albumin was found in the urine of 4, or 6 per cent., of 70 babies ill with acute intestinal indigestion. There was the slightest possible trace in 2 instances, a very slight trace in 1 and a trace in the other. There was no sediment in 1 and it was negative in another. In the third it showed a few bladder cells and many bacteria; in the fourth a few leukocytes, squamous and round cells and a considerable amount of normal blood, but no casts. This baby died seven days later. The urine was turbid in 15 per cent. of the cases without albuminuria. The sediment was usually not examined under these circumstances, but when it was, the turbidity was most often due to an excess of phosphates. The relative duration of the illness before the examination of the urine was essentially the same in both those with and without albuminuria. Seven, or 11 per cent., of the babies without albuminuria, and 1, or 25 per cent., of those with albuminuria, died. The time of the examination before death was, in those without albuminuria, one day, three days, three days, five days, six days, twelve days, and twenty days, and in that with albuminuria seven days.

All the babies with albuminuria vomited, while 54 per cent. of those without albuminuria did not vomit at all. The severity of the vomiting, however, was no greater in those with albuminuria than in many of those without it. None of the babies, whether they did or did not have albuminuria, had any edema. One of the babies without albuminuria was very restless, another had convulsions and 2 others were in a condition of moderate stupor. None of these symptoms was present in those with albuminuria. Marked prostration was a common symptom in many of those whose urine was normal and was noted in one of those with albuminuria. The temperature was on the average no higher in the babies with albuminuria than in those without it.

Infectious Diarrhea.—Albumin was found in the urine of 10, or 16 per cent., of 61 babies ill with infectious diarrhea. The amount of albumin and the nature of the sediment, as well as the final results, are shown in the following table:—

TABLE II.

No.	Duration	Color	Reaction	Sp. Gr.	Albumin	Sediment	Result
1	14 days	Normal	Acid	....	Slight, possible trace	Not examined	Well
2	15 days	Pale, cloudy	"	1002	Slight, possible trace	None	
	24 days	Pale, opaque	"	1008	None	Leukocytes; epithelial cells; bacteria	Dead in 2 days
3	14 days	Pale, clear	"	....	None	Not examined	
	21 days	Pale, turbid	"	....	Slight, possible trace	Many small round cells; few leukocytes; occasional hyalin casts	Not relieved
4	14 days	Normal	"	....	Very slight trace	Very slight; few squamous and small round cells	Dead in 2 weeks
5	21 days	Normal	"	....	Very slight trace	None	Dead in 4 days
6	9 days	Normal	"	....	Very slight trace	Slight; few fatty small round cells; free fat globules	Dead in 10 days
7	?	Normal	"	....	Very slight trace	Few squamous cells; occasional small round cell; rare red blood cell	
	8 days later	High	"	....	None	Not examined	Dead same day
8	21 days	Pale	"	....	Slight trace	Negative	Relieved
9	21 days	Pale, cloudy	1 "	1011	Trace	Few small round and squamous cells; no fat, blood or pus; numerous hyalin casts with round cells adherent; Some epithelial casts	Dead in 3 weeks
10	19 days	Normal	"	....	Trace	Not examined	Dead in 1 day

The urine was often turbid or cloudy when there was no albuminuria. The turbidity in these instances was usually due to urates or phosphates, most often to phosphates. Very many bacilli with a few squamous and round cells were found in 2, and many pus cells in another urine in which there was no albumin. The sediment was usually not examined when no albumin was found. If it had been, it is probable that more cases of bacilluria and pyuria would have been found. Twenty-one, or 41 per cent., of the babies without albumin, and 7, or 70 per cent., of those with albumin in the urine died. The duration of the disease at the time of the examinations of the urine in both those which did and did not contain albumin was essentially the same; so also was the date of the last examination in the fatal cases. All the babies with albuminuria had fever at, or immediately preceding, the time of the examination, while 27 per cent. of those without albuminuria had none. The average temperature of the babies with albuminuria was also higher than that of those without albuminuria. No baby of either class had any edema, although one without albuminuria had a marked angioneurotic edema. Four, or 8 per cent., of the babies without albuminuria were very restless. This symptom was not noted in any of those with albuminuria. Slight stupor was noted in 3, moderate in 2, and marked in 2, or 14 per cent., of the babies without albuminuria, while 3, or 30 per cent., of those with albuminuria were markedly stuporous. The following facts show, however, that there could not have been any direct connection between the stupor and the albuminuria. In one instance the stupor was only moderate at a time when there was a very slight trace of albumin and an occasional renal and blood cell in the urine, while it was very marked on the day of death, a week later, when the urine showed nothing abnormal. In 2 others the stupor was marked, although the urine contained only the slightest possible trace of albumin and there was no sediment. Fifteen per cent. of the babies with albuminuria and 54 per cent. of those without it had not vomited for some time before the examination of the urine. On the other hand, a number of the babies without albuminuria had been vomiting a great deal, while none of those with it had been doing so. Moreover, in two instances the vomiting was the same when the urine did and did not contain albumin, the examinations having been made eight days apart. In another the vomiting had almost entirely ceased before death, three weeks later. It seems evident, therefore, that there was no connection between the vomiting and the albuminuria.

Summary.—A review of these figures shows that albuminuria was found in but 8 per cent. of the babies suffering from chronic disturbances of digestion. There was never more than a trace of albumin and it was almost never accompanied by casts. The sediment usually showed only a few cells of one sort or another, thus suggesting some affection of the bladder or pelvis of the kidney rather than of the renal tissues. The albuminuria was never accompanied by edema, and vomiting was no more common in the babies with albuminuria than in those without it. The presence of albuminuria had no effect on the prognosis.

Albuminuria was a little more common in the babies suffering from the acute than in those from the chronic diseases of the gastroenteric tract, being present in a little more than 10 per cent. There was, however, never more than a trace of albumin, and this was not, as a rule, accompanied by casts or blood. If so, the diarrhea was almost always of the infectious type. The sediment more often consisted of leukocytes and cells, thus suggesting an affection of the bladder and pelvis, as in the chronic cases. The presence of albuminuria had no effect on the prognosis in the acute gastric cases. The mortality was, however, considerably higher in the intestinal cases with albumin than in those without it. Vomiting was more common in the babies with albuminuria, but was no more severe in type. The albuminuria was not accompanied by edema in any instance. Symptoms of disturbance of the nervous system, such as restlessness, convulsions and stupor, were possibly a little more common in the babies with albuminuria than in the others. There was, however, nothing to suggest any direct connection between these nervous symptoms and the albuminuria.

Conclusions.—The conclusions which seem to be warranted by this purely clinical study are as follows: Albuminuria is found in from 8 per cent. to 10 per cent. of babies ill with various diseases of the gastroenteric tract. It is found somewhat more often in the acute than in the chronic diseases. Judging from the examination of the sediment, the pathologic condition in the kidneys almost never progresses beyond that of acute degenerative nephritis (often known as cloudy swelling or active hyperemia). Infection of the urinary tract, resulting in the symptom-complex commonly known as pyelitis, or pyelonephritis, is far more common than acute parenchymatous or interstitial nephritis. In the chronic diseases there is no relation between the albuminuria and the mortality or symptomatology. The mortality is higher in the acute diseases when albuminuria is present than when it is not. The presence of albuminuria in an individual case does not, however, materially modify the prognosis in that case. Edema occurring in the course of diseases of the gastroenteric tract is not connected with the condition of the kidneys. There is nothing to suggest any causative relation between the affection of the kidneys and such symptoms as restlessness, convulsions and stupor. These are due to toxemia and not to uremia.

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DISCUSSION.

Dr. Churchill.—Was the omission of the microscopic examination intentional or because it was thought safe to ignore it? In some cases this is important even when there is no albumin found. In one or two cases I have found a considerable number of leukocytes and other cells, indicating considerable renal irritation, though albumin has not been found later on in the course of the disease. I have always taught my students that the microscopic examination of the sediment should be made whether albumin is present or not.

Dr. Koklik.—I agree with Dr. Morse that it is difficult to fix the exact significance in these cases of the albuminuria and nephritis. The condition seems to me to be simply one of the manifestations of the general toxemia. In some cases the amount of casts and albumin is striking. Many of these investigations were carried on at a time when the children were much sicker from summer diarrhea than we now see them. True cholera infantum is not so frequent at the present day because of the improvement, even among the poor, in methods of feeding and the handling of the food.

Dr. Miller.—For some time it has been my observation that in the cases of continued and acute diarrhea seen at the hospital there has been found a small amount of albumin without any apparent nephritis during the course of the disease. I believe that it is of no significance whatever, and is due, as Dr. Morse has said, to the general toxemia. The presence of albumin and casts in typhoid fever, and other infectious febrile states, is a very common phenomenon, more so, I think, than recorded investigations would have us believe, but it is of no significance, except as showing the intensity of the toxemia; and this is true, also, of the diarrheas of infancy.

DR. MORSE (closing remarks).—I agree with Dr. Churchill as to the importance of the microscopic examination of the sediment. The sediments were not examined in these cases because the urine was examined merely as a part of the routine work in the hospitals and there was no intention at the time of using them in this connection. In one way it makes the results of the paper more unbiased.

Dr. Koplik is almost certainly right in attributing the variations in the results obtained by different observers to differences in the classes of cases studied. I do not see, however, why I should not have found as much trouble with the kidneys as has any one else, because a large proportion of these cases were at the Floating Hospital, which is the dump for all the bad cases of Boston and vicinity. I do not think any one can have a worse set of infants than we get there.

THE SEQUELÆ OF CEREBROSPINAL MENINGITIS.—Cohn (*Berlin Klin. Woch.*, No. 2, 1909). The prospects of a permanent and complete cure are more favorable in children than in adults, according to the author's investigation of a clinical material of 27 patients who had recovered from the disease. The diagnosis in all these cass had been confirmed by the bacteriologic demonstration of meningococci in the spinal fluid. In the case of adult patients, remote results of the disease were generally still perceptible two and a half years later. Complete recovery, without subsequent disturbances of any kind, was found to be still possible in severe, and even in extremely grave, cases. The occurrence of hydrocephalus is still possible up to apparent recovery of four weeks' duration. The most dangerous complication is deafness, which, when once established, is irreparable, whereas all the paralytic phenomena gradually subside, and even choked disc may undergo retrogression.

The agglutination of the blood serum with meningococci could still be obtained over a year later in 2 of the cases.—*Medical Review of Reviews.*

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THE NEWBORN.*

BY HENRY ENOS TULEY, M.D.,

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It is my purpose in this paper to make a plea for the rights of the newborn and to insist that its condition demands more than the ordinary cursory examination given it at birth. This examination usually amounts simply to an investigation to ascertain whether deformities are present and whether its respiration has become properly established. Except in larger communities the majority of labor cases are attended by the busy family practitioner and not by a specialist in obstetrics, and the pediatrist is not called in unless something abnormal develops during the early weeks of the child's life. No subject should be of so great interest to the general practitioner as a consideration of the newborn, as they present many interesting, and oftentimes serious, problems for solution, and when they are discussed there should be a closer relationship between the general practitioner, the obstetrician and the pediatrist.

Because of the small amount of attention paid the infant at birth it seems to belong neither to the obstetrician, the general practitioner or the pediatrist, but rather to the nurse or the first unemployed person who happens to be in the room, to whose tender mercies the child is given as soon as it has demonstrated its ability to breathe.

The principal consideration immediately after the birth of the head is to thoroughly cleanse the mouth of mucus to prevent its aspiration into the lungs, and to wipe the eyes preparatory to the insertion of the silver solution into them immediately after the completion of the third stage. I would plead for universal use of the Crédé treatment of the eyes, or, if preferred, the use of one of the newer silver salts. Personally I much prefer the 2 per cent. solution of nitrate of silver. A drop of this solution is placed in each eye, followed after a closure of the lids by a few drops of the normal salt solution.

My contention is for the universal use of one of the silver salts, which of themselves are entirely harmless, and will effectually prevent ophthalmia neonatorum, one of the most severe complications known to obstetrics. With the knowledge that this remedy will positively prevent ophthalmia, and if properly used will have no ill effects, are we justified in reserving its use for that very small percentage of cases where we have certain knowledge that a latent gonococcic infection exists in the maternal genital tract? The impossibility of obtaining an accurate and reliable history of this infection is apparent to all, hence the risk in omitting the Crédé prophylactic treatment is too great to take, and if ophthalmia develops following its omission, I take it the practitioner is grievously at fault.

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* Read before the Lexington and Fayette County Medical Society, Lexington, Ky., March 9, 1909.

The importance of this treatment is the more forcibly emphasized when the statistics of the blind schools of the country are known. From 20 to 25 per cent. of the blindness of the inmates was caused by gonorrheal ophthalmia, an unnecessary and preventable calamity. That the majority of these cases occur in the practice of midwives we believe is true, but too large a proportion occur in the practice of physicians, and it is to those who do not consider the prophylactic treatment necessary that we would appeal.

The maintenance of body heat is too often neglected during the first few hours after birth. Keeping up the body heat is important in every newborn infant, but particularly so in the premature. There is at least 20° difference between the intrauterine and the atmospheric temperature and after the first reflex effect of the cool air upon the skin in aiding the establishment of respiration has been had, the body temperature should be maintained by warm coverings and, if necessary, close proximity to hot-water bags.

Here again may be mentioned the necessity for watchfulness of the details in caring for the newborn. Within the past month I had under my observation a newborn baby which was laid upon a hot-water bag by the nurse with a resulting burn 2 by 3 inches upon the left buttock, which required two weeks to entirely cicatrize. This was inexcusable and an "accident" which, we warrant, will not occur again to that nurse.

The use of fine silk in tying the cord is a mistake too often made. A rubber or elastic ligature is by far the safest, the next safest being linen or silk and linen tape. The tape rather than a fine silk ligature should be employed in order not to cut the vessels. Frequent inspection of the cord should be made during the first hour or two after delivery, in order to ascertain whether or not there is a hemorrhage, however slight, from the severed vessels. I have seen one premature infant sacrificed from a hemorrhage of the cord due to the cutting of the vessels and the hemorrhage going unrecognized owing to the failure to inspect the cord.

If the infant is not in the care of a nurse known to be entirely trustworthy, the first ministrations to it should be under the eyes of the attending physician. If born during the early hours of the morning the only attention should be the dressing of the cord, the thorough anointing of the body with any oily substance to disintegrate the vernix, and the application of the binder, the napkin and the shirt.

The possibility of an infection taking place through the cord at its point of separation should always be borne in mind, hence I claim some protective dressing is absolutely necessary and the cord should not be left undressed, as is advocated by some. In my experience the balsam of Peru and castor oil dressing advocated by Gallant has much to commend it. A solution of 20 or 30 minims of the balsam of Peru to the ounce of castor oil is applied to the stump of the cord, which is pulled through a protecting pad of gauze 2 inches square, with a hole in its center or cut half through from the side. A dry piece slightly larger and the binder are placed over all. This dressing should not be disturbed except to apply a small amount of the balsam and oil until the separation of the cord, which, in the majority of instances, will take place about the fifth day. It is an exception to find anything but a smooth, dry base at the navel when the cord has separated after the use of this dressing. This dressing leaves a soft, pliable stump unlike the very hard, sharp pointed one which results from a dry powder dressing.

After the necessary attentions of the morning have been given to the mother the child is given its first bath in the nurse's lap, when the disintegrated vernix can be easily removed with a soft piece of gauze and a little soap. After the bath the child is dressed and given to the mother, and if a primipara both baby and the mother are instructed in the first nursing. This proceeding is apt to be wearisome to everybody concerned, but if persisted in faithfully the first two or three nursings there is usually no further trouble. If the breast is large and flabby the possibility of the child being asphyxiated from burying its nose in the soft gland must be borne in mind. The mother must be instructed how to lie, how to place the baby, and to use one finger to hold the breast away from the baby's nose.

The question of nourishment of the baby is the most important to be solved in connection with the care of the newborn. During the first three days it is a constant fight with grandmother and mother to keep them from feeding the baby, "to keep it from starving," before the mother's milk comes. Firmness during this trying period will bear rich fruit in discipline of both mother and baby in the weeks to come. During the first three days the breast secretes but little fluid, no milk, until the end of the second, or sometime during the third day. If this is borne in mind much trouble with the nipples will be averted if the child is put to the breast every six hours during the first twenty-four hours, every four hours during the second day, once during the second night, every three hours during the third day, twice during the third night, and every two hours during subsequent days and twice at night. This infrequent nursing during the period when the breasts are practically empty following the first nursing, when the colostrum is drained away, is as effectual as anything possibly could be in preventing cracked, eroded and fissured nipples. Pulling and tugging at a practically empty breast is one of the most frequent causes of this annoying complication.

A word might be said about colostrum, which may be a cause, infrequently looked for, of severe digestive disturbance of the infant which is breast-fed. Practically the exclusive content of the breast during the late months of pregnancy and during the first week postpartum is colostrum, and it does not reappear except under abnormal conditions, as the reappearance of menstruation, pregnancy, severe mental conditions, as fear, anger, great distress, etc.

A case in point may be mentioned as an illustration of colostrum disagreement. A six-months-old child, breast-fed, was seen in consultation in an adjoining "blue grass" city severely ill with erysipelas, involving the nates and left lower extremity. It was fat and extremely well nourished, with perfect digestion. The mother was under a great mental and physical strain, losing sleep and deeply distressed. About the ninth day of its illness an acute gastrointestinal disturbance began in the infant, with vomiting and a mucous diarrhea. The breast milk showed colostrum.

Shifting of responsibility of the care of the child to a trained nurse, the exercise of a strong will to control herself, and two nights' sleep, resulted in an increase in the quantity of the milk and a compelte disappearance of colostrum from the milk.

It has been my misfortune to have seen several cases during the past winter in which early artificial feeding had to be resorted to. Two of these were because of double fissured nipples, and in spite of vigorous precautions double infection of the breasts and abscesses. In the others, although every known measure was tried, the milk failed, the babies did not gain in weight, and when a loss was shown, modified milk was prescribed.

I do not think we encounter the unnatural and unfeeling mother, who wishes for social and other reasons to put her baby on the bottle, as often as some practitioners indicate. I have seen but one in two years, and made myself very unpopular then because I would not prescribe a modified milk formula, and tell the mother how to dry up her milk.

A diminishing supply of breast milk can often be increased by careful regulation of the diet, prescribing one which, as Southworth has suggested, consists largely of milk and cereal gruels or porridge. I have seen decided increase of milk following hyperemia produced by Bier's method. A bell jar must be used which will easily include the entire breast and the vacuum just short of pain continued for at least thirty minutes twice during the day.

Should artificial feeding be necessary, as carefully written directions must be given for the preparation of the food as would be for the preparation of a prescription for medicine. A good wet nurse should be provided, if possible, but all know how difficult these are to obtain, even in a city the size of Louisville. Cow's milk is the next best substitute, and it must be carefully modified to meet the needs of the individual child. This cannot be done in a haphazard fashion, but only with a definite know[1] edge of the requirements in the case. One must learn to think in percentages of the three chief ingredients of milk, viz., fat, sugar and proteids. A modified milk is an adapted milk, these ingredients being adapted to the individual needs of the child.

The chief requirement is to obtain a clean, pure milk for the baby. The ordinary city market milk is absolutely unfit for consumption by the baby; the average country milk is also unfit for baby feeding. An examination of the market milk of Louisville in the summer of 1908 showed an average bacterial content of 20,939,900, while that of certified milk ran much below 10,000 bacteria to the cubic centimeter, and none of these pathogenic. These counts were exhibited at the Milk Exhibit of the Jefferson County Fiscal Court at the State Fair in 1908.

I would here record a practical observation made recently in regard to the use of the vacuum bottle in keeping the baby's milk warm at night. There are a number of these vacuum bottles sold under different trade names for keeping hot things hot and cold things cold, all emphasizing the great boon they are to the overworked parent in keeping the milk warm at night, but discreetly saying nothing of the menace they are to the infant.

A nine-months-old infant had been breast-fed, and gained regularly and rapidly with the exception of the three weeks previous. Having no teeth and with the history of stationary weight I deemed it wise to give two artificial feedings of modified milk a day, which was done, certified milk being used. In four or five days a report was made of loose, green stools, whereas constipation had existed previously. The formula was one which I felt sure could not disagree, so close inquiry was made into the preparation of the milk. This elicited the fact that a vacuum bottle was being used for the milk which was given in the early morning. The feeding bottles were prepared as prescribed, in the morning, kept cold until ready for feeding, then warmed. The one to be fed in the morning was warmed and put in the vacuum bottle and poured into a clean nursing bottle in the morning when the baby awakened.

The "labor saver" was suspected as being the cause of the trouble. At my request the milk was prepared as usual, and the bottle of certified milk carefully covered which had been used in preparing the modified milk. Both it and the vacuum bottle were sent to the laboratory the next morning and plated. The count of the certified milk showed 3,500; the count of the modified milk showed in the labor-saving vacuum bottle 1,400,000 bacteria to the cubic centimeter. Without change of formula or administration of a drop of medicine the baby improved and began gaining with perfect digestion as soon as the use of the labor-saving bottle was discontinued.

If it is recalled that it is not the bacteria themselves which cause trouble so much as their toxins developed in the milk, but more especially in the gastrointestinal tract after its ingestion, the question might well be asked: "How many bacteria with their accompanying decomposition products can a baby take in its milk without injury?" A general answer to the question is an impossibility, but the above case throws some light on the subject and gives a much more definite meaning to the statement that a milk contains a certain number of bacteria per cubic centimeter. In the case mentioned, the digestive tract of a perfectly healthy child of nine months was apparently seriously affected by the amount of poison represented by about 2,000,000 bacteria. To be sure we do not know exactly the number of bacteria in the milk from day to day, but with the fresh milk running as it was it is probable that 1,000,000 or 2,000,000 fairly represents the number incubated in the vacuum bottle during the period of the baby's illness.

As soon as the irritants were withdrawn and the baby was put back on milk of a low count (under 10,000), normal conditions were re-established at once. When we consider that much of the milk which is supplied to babies, especially in the summer months, contains 2,000,000, 10,000,000, 30,000,000, 50,000,000, and even more it is not surprising that serious intestinal conditions are common or that in many cases the amount of poison is so great as to lead to a fatal result.

Every city of a population of 5,000 or over should have its Medical Milk Commission, which could certify to the health of the milk herd and employees, the methods of producing, bottling, handling and delivery of the milk, so as to provide a pure milk for the infants and invalids of that community.

The hemorrhagic diseases of the newborn are comparatively frequent. The bleeding may occur from any of the mucous membranes or it may be subcutaneous, intracranial or intra-abdominal. The cause of the hemorrhage in the class of cases included in this term, hemorrhagic disease, is more than likely a blood change which prevents its clotting, as indicated by the report of 2 cases in which transfusion of blood from parent to child was followed by a cessation of the bleeding and recovery in 1 case, and a temporary improvement in the other. The same result has been noted from the injection of a 2 per cent. gelatin solution, subcutaneously, in 4 of my cases, 3 recovering permanently, the fourth showing a complete cessation of the hemorrhages, but the child succumbing to tetanus on the twelfth day. The gelatin solution used in all of these cases was prepared by a supposedly reliable pharmacist, according to instructions to doubly sterilize it, but the solution used in the last case on bacteriologic examination afterward showed the tetanus bacillus. The contamination of the ordinary commercial gelatin with the tetanus bacillus is well known, but it is much less apt to be present in the English gelatin, yet a double complete sterilization should be sufficient to destroy its spores, and, in view of the good results obtained in the 3 cases, I would advocate its use in the next case seen if I had personal knowledge of the proper sterilization of the solution.

Jaundice in the newborn is present, in varying degree, in fully 70 per cent. of cases; in but a small percentage of these very severely. The cause of jaundice is not definitely known, but it is believed to be a manifestation of sepsis. Owing to the frequency of septic invasion through the navel and its conveyance to the liver through the ductus venosus and portal vessels, a septic process is set up in the gall bladder and ducts with absorption of bile. Its prevention is of the greatest importance by proper care of the umbilical stump and excluding possible infection. One-fourth grain of calomel in $^1/_{20}$ grain doses is of the greatest benefit where jaundice occurs.

Constipation is the normal condition of the infant, from the third or fourth month. This is due to the conformation of the sigmoid and colon. The sigmoid in the infant is longer in proportion to the length of the colon than any other portion of it, and the mesosigmoid is longer than it is in later life, giving the sigmoid a wider range of motion. Hence this portion of the bowel is often found beyond the median line of the abdomen, on the right side, and as it is the reservoir for the fecal accumulation of the intestines until the bowel contents reach the rectum there is no passage of fecal matter. No change of diet will accomplish regular daily evacuations, and they must be had by the administration of daily enemata, or alternate use of the enemas or glycerin or soap suppositories. As the child grows, with lengthening of the abdominal cavity and deepening of the pelvis, the descending and transverse colon lengthen at the expense of the sigmoid. The sigmoid becomes much straighter than before and unassisted movements from the bowel are more frequent. The futility of administering purgatives is thus explained. No harm can result from the enema or suppository during the few months they may be needed.

I have had much satisfaction in the use of report blanks modelled after the suggestion of Holt, in watching the progress of infants, especially those artificially fed. A number of these blanks are given to the mother with the request that they be returned regularly, with the upper part filled in carefully. In no other way can the child's growth be as intelligently watched and serious nutritional disorders forestalled.

A word might well be said in regard to the old custom, I think less frequent now, of enveloping the child in a very snugly, and often very tightly, applied abdominal binder, after the separation of the cord. I have seen 2 cases of inguinal hernia, double in 1 child, which resulted from the wearing of such a binder. This should never be permitted. The only purpose a binder serves is to prevent an injury being done the cord before it separates. The baby unquestionably needs a protective covering over the abdominal organs during the first two years of its life, and this can be obtained best by a woven sleeveless binder with short tapes in front and behind, which are pinned to the napkin, thus keeping it closely fitted to the body. It is worn under the shirt, and gives the proper protection to the abdomen without causing pressure.

The temperature of the baby should be taken, in the rectum, with a special rectal thermometer, with the same regularity as the mother's is taken during the puerperium. During the first week there is very apt to be a rise ranging from 101° to 105° F. This rise has been variously explained: by several it is attributed to sepsis, by others to starvation. I have seen too many babies relieved of this fever by a small artificial feeding, especially when the mother's milk was slow in coming, without any therapeutic remedies, not to believe that starvation is a factor in many cases of otherwise inexplicable temperature in the child. Associated with the fever, in these cases, is restlessness, constant drawing up of the legs, crying, hot, dry mouth and skin.

Two complications in infancy are always, in my opinion, evidence of carelessness on the part of the nurse, viz., thrush or sprue and intertrigo. Both of these conditions are preventable. The saccharomyces albicans develops in the mucous membranes of the mouth of the infant, and can be inhibited by the regular use of a solution of boracic acid. Great care and gentleness should be exercised in the cleansing of the mouth, as Bednar's Aptha, a much more serious condition, may develop as the result of trauma of the mucous membrane of the palate. These ulcerations occur over the hamular process of the palate bones, and may be the point of entrance of organisms which may cause a general sepsis.

The eczematous condition of the skin of the buttocks, an intertrigo, is the result of carelessness, allowing evacuations of bladder and bowel to remain long in contact with the skin. Because of the very sticky nature of meconium it is difficult to remove from the skin when it dries, and roughness in cleansing the skin may result in a trauma, the starting point of this eczematous process. No soap should be used on the buttocks, the discharge removed by a soft cloth and water, the skin carefully dried, and a bland unirritating and unscented powder applied. The application of stearate of zinc powder upon the first evidence of redness of the skin is of great value.

Another rather common occurrence is to find an eczema of the skin limited to the area covered by the napkin. This is due to the irritating effect of the dried urine in the napkins, from the custom, so prevalent, of using the napkins several times before they are washed, or, as I was once told by a nurse, until there was an odor to them. Prophylaxis by only using napkins which have been washed is most essential.

Every newborn baby should be provided with a bassinet, unrockable cradle or crib, and under no circumstances allowed to sleep with its mother. An ordinary clothes basket is usually in every household and with pillow for mattress makes an excellent bassinet. If sleeping with the mother the temptation is too great to nurse it whenever it cries and for the mother to fall asleep while doing so, and the child lie for hours with the nipple in its mouth, nursing intermittently all of this time. The French national law prohibiting the custom of infants sleeping in bed with parents is an excellent one. This was gotten up principally to prevent the accident of overlaying the child, which is a possibility to be reckoned with.

At the risk of much criticism I wish to add a word against the practice of indiscriminate circumcision of male infants. To my mind, there is just as much sound reason to the advocacy of universal removal of the appendix vermiformis. The foreskin has its special function, and if proper attention is given it when the child is one month old, no subsequent trouble will be had. My custom is to reflect the prepuce at this time, if necessary, because of a very tightly constricted meatus, doing it in two sittings, gently breaking up adhesions and removing the smegma behind the corona glandis. This part is now anointed with vaselin or olive oil and the foreskin replaced. The mother is instructed in the details of this procedure, carefully told of the danger of paraphimosis, and if reflection is done once a week after this no trouble can possibly occur.

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MALARIA IN CHILDREN.—B. B. Simms and B. B. Warwick, Talladega, Ala. (*Journal of American Medical Association,* September 12), have examined the inmates of the deaf-mute and blind asylums and a number of other children and adults, a total of 610 cases, none of them invalids, for the malarial parasite. Among the deaf-mutes the plasmodia were found in 10.5 per cent. of the males and 6 per cent. of the females; among the blind in 6 per cent. of the males and 3 per cent. of the females. This difference is accounted for by the fact that the females, as well as the blind, are more indoors in the night and are better cared for, thereby lessening their liability to infection. It was also noticed that the majority of the mutes and the blind with the parasite in their blood were from the southern part of the state. Of 38 native children not blind or deaf, the plasmodia were found in 8 per cent., and in 5 per cent. of the negroes. In 156 men the parasite was found in 14 per cent. They also found it in three babies between three and seven days old. Summing up, they found the plasmodia in 8 or 9 per cent. of the whole 610 persons examined. It seems from these observations that many persons carry the malarial parasite in their blood for many months (for they were under observation during that time) without showing active symptoms of the disease, as repeated examinations during that time showed no change in the conditions. The probable reason for this is the small number of the parasites, since it is estimated that there must be from 200,000,000 to 300,000,000 in the human system to produce the paroxysms. It was also observed that the intercurrence of another disease (influenza) tended to an increase of the parasites and the occurrence of malarial symptoms, which also aggravated the intercurrent disease. —*Medical Review of Reviews.*

TREATMENT OF DIPHTHERIA, WITH SPECIAL REFERENCE TO THE PREVENTION OF HEART FAILURE.*

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It is important to recognize that some impairment of the heart muscle occurs in almost every case of diphtheria, and it is imperative that, having recognized this fact, we should realize that in prophylaxis lies our most potent therapeutic aid, and that prophylaxis may be summed up in two words—antitoxin and rest.

We know that in all cases of diphtheria the musculature of the body is attacked, and that no group of muscles suffers so early or so sorely as those of the heart and blood vessels. The result is that circulatory failure is the almost invariable cause of death in this disease. Neglected laryngeal cases, or rare instances of nephritis with suppression of the urine supply the exceptions.

The lesser degrees of circulatory failure are rarely mentioned in text-books, and, in fact, are negligible when treatment of the infection is properly carried out. These slight failures are evidenced by changes in the first mitral sound with some accentuation of the second pulmonic, and many clinicians attribute the alterations to fever; but as the same changes may be heard in afebrile cases of diphtheria, high temperature cannot be their cause; further, in cases that go on to severe failure, the same signs are always present in the early stages. One finds the first evidence that the heart muscle is being damaged in a lengthened first mitral sound with an accentuated muscle tone; within a few hours there is a distinct splitting of the first sound, which, in spite of Leube's dictum "that a split first sound has no prognostic significance" in diphtheria is indicative of beginning muscle failure. The third step of the progress is reached when the muscle tone of the first sound that has weakened progressively leaves the sharp, ticking valvular note dominant, and produces a rhythm akin to that of the fetal heart; and finally there may be a replacement, complete or partial, of the first sound by a soft systolic blow and perhaps also an increase of precordial dullness. Slight cases may go only as far as the second or third step of this progression, or perhaps to the last. As a rule, such patients cause us but little anxiety and return to normal health without incident other than some weakness and a slight cyanosis, and these symptoms are not by any means always met with.

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* Read before the San Joaquin Valley Medical Society.

The interest of such slight changes lies in their prognostic value. If, by the end of the tenth day, we find that a patient still shows such heart changes, we have every right to anticipate the onset of graver circulatory trouble. Or, if early in the disease, the progress through these slighter stages is very rapid, going on to the fetal rhythm or systolic blow in a few hours, we know we are being confronted with severe early failure. This brings us to the consideration of the types of grave failure, which, from the clinician's point of view, are three. First, those in which the poisoning is intense from the onset and in which the patients die or recover during the first or second week. Such cases in the majority of instances have had either no antitoxin or insufficient dosages and present signs of intense intoxication as well as of a rapidly degenerating heart. This class may be subdivided into the cases with slow and those with a rapid pulse. In contradistinction to the other two classes, patients of this class die irrespective of what strain is put on the heart. The failure is inherent. The second group includes cases which die in the course of tracheolaryngeal diphtheria from right heart failure. The degeneration of these hearts is rarely sufficient to kill by itself. The intoxication, as a rule, is not extreme, but the right heart has suffered such damage that it cannot respond to the enormous strain that the thorax, acting against a partially occluded larynx, puts upon it. The third type is that which occurs late in the disease, from the third week to the third month. The cases of this class rarely show much pulse slowing, and, except for the slight signs already outlined, may never exhibit anything unusual. It may even be, and often is the case, that the slighter signs of change have disappeared, and the physician feels justified in allowing his patient some amount of exertion, but the degenerated heart seems unable to respond to what would normally be an ordinary effort, and the patient dies from an acute dilatation of that organ.

Cases of the first class come to the San Francisco City Contagious Pavilion occasionally. In looking over our records for three years I find that of 173 diphtheria patients 26 were admitted later than the fifth day of their disease. In 11 of the 26, in spite of intense intoxication and well-marked clinical symptoms, no antitoxin had been given. I am happy to say that but 4 of these had been in the hands of physicians. It is significant that 2 cases were allowed to run on because the parents mistook the glandular enlargements for parotid swellings and thought that their children had mumps. Of this group of 11 patients, 8 died within two weeks, 5 of them within one week of infection. Of the 26 cases of early failure, only 4 showed extreme slowing of the pulse. In one instance, the count at the radial dropped to 44 beats a minute and remained at that point for thirty-six hours. Cyanosis and dyspnea were noticeable accompaniments of these cases.

Bolton has examined the medullas of 11 such cases and found that in all of them the neuron cells of the vagus nucleus were in a condition of granular degeneration and he attributes the slow pulse to vagus stimulation that follows the irritation which this degenerative process sets up. The fact that atropin, which inhibits the vagus, frequently restores the rapidity of these slow hearts, supports this view, and the further fact that in all such cases which died the pulse rate was markedly increased before the fatal issue, suggests that the stimulation of the vagus had gone on to the point of overwhelming action and paralysis and that the heart, with its vagus control abolished, had raced itself out. This theory takes no note of the fact that in these cases the heart muscle itself is found in a condition of extreme destructive degeneration. On the other hand, many pathologists look on the manifestations of circulatory failure in diphtheria as being entirely due to the changes in the myocardium and in the arterial muscles. It has been shown that the alterations in muscle, which come with acute myocarditis, are competent to produce either a slowing or an increase in the pulse rate. The differences of the pathologists extend even to their explanations for the late failures, those who hold the myogenic theory considering that the late failure is but an exhibition of a loss of contractility and retractibility of the myocardial fibers, with a lowered irritability, giving rise to an acute dilatation, with overfilling of the heart, under slight degrees of strain. On the other hand, the school that looks for its explanation to the nervous system also considers this type of failure to be due to an acute dilatation after degeneration of muscle fibers, but believes that the degeneration is, to a large degree, due to trophic changes following a vagus neuritis, and points out that late type of heart failure occurs at the same period of the disease as does the peripheral neuritis that gives rise to paresis of skeletal muscles, and they would class the two conditions in the same category. Whichever school of pathology holds the true view matters little to the clinician, as his therapeutic attempt is to reach and overcome these changes, whether they be in origin nervous or purely muscular. And in antitoxin he has an agent which, if used with sufficient vigor and promptness, will rob the pathologist of an opportunity to determine what really has taken place.

In considering diphtheritic heart failure the first principle, then, is to give antitoxin. The second is to secure rest for the patient. Seven out of 10 cases may be saved by antitoxin given as is usually done, but to save 2 out of the other 3 it will be absolutely necessary that massive doses be given, and then, if the cases have not been seen early it is only by acute vigil and careful nursing that the remainder will have a chance of recovery. It is very discouraging to find that, in spite of Dr. Burrow's earnest pleas made before the California State Society, some years ago, and in spite of the increased tendency among experienced clinicians to insist upon massive doses of antitoxin, many physicians will allow cases of diphtheria with grave intoxication to go on from bad to worse, fearing to give more than 3,000 or 4,000 units. If antitoxin is indicated at all, at least 6,000 units should be given. Knowing as we do that every hour in which unneutralized toxin circulates adds to the damage it is wreaking on the tissues and knowing further that antitoxin has *no* power to undo such damage, have we any right under the plea of economy, or any other plea whatsoever, to give small doses with intent to repeat them within twelve or twenty-four hours if we find that our guess has been wrong and that we have not completely neutralized the toxins? My answer is absolutely and unequivocally, No. There is neither reason nor economy in such a procedure. It may be that a severe poisoning will demand several repetitions of the serum, but, as a rule, an initial and promptly given dose of 8,000 units will more rapidly remove the faucial membrane, swelling and fetor, more surely overcome the intoxication and more certainly prevent heart failure or paresis than three or four doses of 4,000 units. I have never had reason to regret giving massive doses and I have given so large an initial dose as 28,000 units, but I learned through a series of bitter early experiences that the cases which developed circulatory incompetence or muscular paresis almost invariably fell either into the class that had been given small repeated doses over a number of days, or the group that had been without antitoxin five or more days after the symptoms appeared. What, then, are the criteria that must guide us in fixing our initial dose of antitoxin in diphtheria? They are, first, the degree of intoxication; second, the time elapsed since the appearance of symptoms; third, the extent of the local involvement; and fourth, laryngeal involvement.

The degree of intoxication. It has been said that the prognosis in diphtheria is inversely proportional to the amount of resistance the child makes to the injection. This statement merely emphasizes the fact that a patient deeply intoxicated by diphtheria poisoning is lethargic, sometimes to the point of somnolence. The picture is characteristic. A sleepy individual presenting a yellow-white, waxy face, with bright-red cheeks, a face that looks like the faces of the wax saints one sees in Roman Catholic shrines, with more or less cyanosis of lips and finger-nails. The pulse is rapid or perhaps unduly slow and oftentimes irregular in force and rhythm. The heart will probably be found enlarged both to the right and to the left. The second pulmonic sound will be accentuated, the muscle tone of the mitral first more or less lost, the first and second sounds at the apex approaching one another in character, or there may be a soft systolic bruit. Such, in brief, is a picture of the toxemia which is the most important criterion we have for measuring our doses, and we should act according to the apparent intensity of the poisoning, not fearing to give 30,000 or 40,000 units to begin with if the toxemia is alarming.

The second criterion is that of time. If a case is not seen until after the fifth day, irrespective of its severity, it should receive an initial dose of not less than 12,000 units.

The intensity of the local condition is not necessarily, although it often is, an indication of the gravity of the case, and as a general rule the doses should be proportioned to the intensity of swelling and fetor, extent of membrane, and involvement of the cervical lymph glands and blocking of the nares. But it must be remembered that slight local involvement with extreme toxemia will always call for bigger doses of antitoxin than cases in which the local signs are apparently grave and the constitutional symptoms slight. The laryngeal cases are among the most alarming in appearance and the most satisfactory to treat. It is my invariable rule to give to a patient with involvement of the larynx 12,000 units on sight, and a second 12,000 in twenty-four hours. This last because not infrequently we have a tracheolaryngeal cast coughed up within twenty-four hours, followed by the formation of a second membrane, which the second dose effectively prevents. Under this treatment it has happened only once and in that instance we got two perfect tracheobronchial casts, the first complete on both sides to the fifth bronchial bifurcation. After the expulsion of the second cast, a third dose of 8,000 units was given the patient and recovery was complete. Under this plan in three years out of 16 laryngeal cases we have been forced to intubate but three times. Some authorities advise that the dosage of antitoxin should vary according to the age or weight of the patient, a procedure which does not appeal to me. I have given a child nine months old, suffering from combined nasal, faucial and tracheal diphtheria, 38,000 units with the happiest results and have never seen any ill effects follow from large doses, even when given to infants. A large initial dose, by removing the necessity for repetition, also makes the danger of an anaphylactic reaction remote. I would not be understood to advocate immense doses in all cases of the disease. Where the systemic poisoning is slight, patients recover completely and promptly after the injections of 6,000 or 8,000 units, and they will get well if given 3,000 or 4,000, but recovery will be slower and more apt to present complications. Moderate degrees of intoxication call for from 8,000 to 10,000 units and massive doses of 20,000 to 50,000 units should be reserved for deeply poisoned cases which show marked lethargy and cyanosis with or without heart involvement. Of late, some observers have urged the value of intravenous injections of antitoxin when the case was urgent. In my service we had recourse to this expedient once. Case of a boy, L. K., aged twelve, seen for the first time on the twelfth day after the appearance of symptoms. The tonsils and uvula were covered with thick grayish membrane, the patient was breathing through his mouth, the nares were filled with membrane, which extended down on to the excoriated upper lip, eyes were exuding pus from which was grown the Klebs-Loeffler bacillus; the characteristic waxy, toxemic facial expression was not marked, but the cyanosis was very striking. Respiration was slow and labored, the pulse was from 120-140 and was hardly perceptible at the wrist, the heart showed the slight changes in muscle tone of the first sound that I have already outlined in this paper. The injection of 12,000 units of antitoxin in twenty-four hours produced no amelioration and a second dose of 16,000 was given him. At the end of another twenty-four hours his condition was, if anything, worse. He had developed a marked soft, systolic blow at the apex, the right and left heart were both enlarged and the pulse was barely perceptible at the radial artery. Cyanosis had increased and the respiration approached Cheyne-Stokes rhythm in character. Without anticipating any relief it was decided to try intravenous injection and 10,000 units were put into the median basilic vein. Within four hours the lethargy had departed, the heart had become more regular and increased in its force, and the respiration became normal. We had believed the boy beyond help and were astonished at this ready response and gratified that from this time he went on to rapid recovery. Four months later when seen he still had an incompetent heart, with well-marked enlargement and a mitral systolic blow and an accentuated second pulmonic, but the circulation slowly gained competence. The result of this trial, which corresponds completely with Voelecker's experience, has made us resolve that in the future, if confronted by any intensely toxic case, we will not neglect intravenous injection of antitoxin. This case showed no rash following the antitoxin.

The question naturally arises whether these massive doses of antitoxin have a bad after effect. The experience is practically universal that the only drawback to the use of antitoxin is the production of rashes. I once prepared a table in which I divided my cases into those which had received 10,000 units or more and those which had received less than 10,000. Thirty-one per cent. of the first class and 29 per cent. of the second showed rashes. The most severe rash I ever saw, however, occurred in a patient who had received but 2,000 units, and one patient who had been given 68,000 units did not exhibit any eruption.

Six thousand and 9,000 units produced the only cases that I have seen of the scarlatiniform type of antitoxin rash. These cases had the typical joint swellings and pain with high temperature and a rash hardly distinguishable from that of scarlet fever, except for the fact that there was neither circumoral pallor nor strawberry tongue. These cases both recovered without incident within seventy-two hours under treatment with hot packs and purgation. During the last few years we have been using either calcium chlorid or calcium lactate to combat the urticarial rashes, and it is most unusual for the wheals and irritation to last more than a few hours. Occasionally, however, the calcium fails and the rashes persist three to five days. In such an instance, we can usually control the irritation by the use of 5 to 10 per cent. menthol ointment.

I have seen no reason to believe that antitoxin has any ill effect on the kidney. Sometimes after antitoxin injection, albumin will appear in the urine when it has not been noted before, but it soon disappears. The most important question to be answered is, Does antitoxin cause heart failure or paresis? That heart failure is not due in any event to antitoxin is clear when we turn to Von Leyden's classic account of heart failure in diphtheria, written a decade before the Klebs-Loeffler bacillus was isolated; and all of us have had the evidence of our own senses when confronted with fatal cases of the disease which had not been injected and which died from circulatory failure.

If the first principle of the treatment of heart failure in diphtheria is promptly to give sufficient antitoxin—intravenously if need be—then the second is to secure rest for the patient. In the earlier days of the attack, if it be severe, the intense lethargy due to the poisoning insures bodily quiet up to within a few hours before death, when extreme restlessness may set in. Often, however, with the less grave degree of poisoning, especially in the case of children, there is intense restlessness and the constant movement may cause over-strain of the poisoned heart and lead to an alarming degree of failure. In such cases some authorities advise restraining harnesses, or forcible retention in recumbency. To my mind, all such devices are inherently vicious and defeat their own purposes. Most of them are inefficient, and although children may not be able to move in those that are efficient, their efforts to do so are as bad, or worse, for the heart than any amount of movement could be. Our practice is to give such children camphorated tincture of opium in doses just sufficient to keep them drowsy. By this practice we accomplish three things: We depress the sensorium, we rest the heart and we get whatever stimulant action the camphor and opium may have on the myocardium. In our service every case of diphtheria, no matter how slight, is considered one of potential circulatory failure and the heart is carefully watched from day to day for the signs of those slighter degrees of involvement which not infrequently precede graver failure.

The value of this careful watch over the competence of the heart is especially evident in the secondary type of failure. And as patients with this type do not ordinarily succumb, except as the result of some superimposed strain, most often the strain put on the heart when the patient assumes the erect position, we are usually able to forestall this calamity and by watching the return of the heart muscle to health to guard it from any stress to which it might be unable to respond. In our experience, in the case of adults, when death does result from secondary failure, it is always because the patients have grown restive under restraint and, in spite of advice, have over-exerted. In the case of little children neglect of the bowels may be followed by distention of the abdomen, which restrains the diaphragm, interferes with respiration and robs the heart of the full aspirating effect of the lungs, and this train of circumstances may supply the fatal overstrain. Even the effect of straining at stool may be sufficient to overbalance the poor compensation of the injured heart muscle. It is to prevent such an unhappy accident that we needs must be careful to secure a daily effortless evacuation and must bend our energies to provide a diet at once digestible and nutritious—one that will not tend to produce flatus. The diet that best meets these requirements is of milk and eggs with a little alcohol in the form of brandy or whiskey. Small amounts of dilute egg-nog, 6 to 8 ounces each three hours, or if the patient is very ill 3 to 4 ounces every two hours, make an ideal diet in the early days of the disease. Bottle-fed babies should have their usual diets reduced one-third in concentration and the amount given at a feeding lessened. It is very important if there is exhibited any tendency toward vomiting to feed these infants fat-free milk and when the production of flatus persists in spite of the dilution of milk, to reduce the sugar in the food. For emptying the bowel we rely on calomel, ¾ to 3 grains, or gray powder, 1 to 3 grains, given in divided doses, followed by from 2 drams to 2 ounces of black draught, and we have not needed to try anything else. The great advantage of this combination is that it seems to allay vomiting and to produce a rapid process of evacuation without griping or strain.

For the past two years it has been my practice to give subcutaneous injections of normal saline solution containing caffein benzoate to those patients who have shown extreme degrees of intoxication. This treatment has been followed irrespective of the disease, and I believe that in this method we have a most potent means of combating the intoxications of typhoid and scarlatina as well as a powerful aid to antitoxin to help our profoundly toxemic diphtheria patients recover their normal metabolic balance. Especially in those cases where the kidney suffers and there is diminution or suppression of the urine is this measure indicated. A brief résumé of a case that I feel was saved by this means may perhaps interest you. (Hillmer.) Aged four, June 13, 1907, admitted on the fifth day of disease, which was laryngeal in type. Temperature, 102°; respiration, 34. Great dyspnea; slight cyanosis; croupy cough; no pain, recession of ribs; no membrane in throat. Klebs-Loeffler bacilli in culture from pharynx. Leukocytosis, 16,000. Fifteen thousand units antitoxin given. The following day the breathing was improved, dyspnea slight, and 9,000 units were given. The tenth day of the disease, afternoon temperature was 102°; this was taken to be a result of the rash which appeared, but disappeared the next day under the influence of Ca Cl 2. In spite of the disappearance of the rash the temperature held up; the pulse, which had dropped, went up again to more than 120 and was low in pressure; dyspnea was marked and the boy became very drowsy, but exceedingly irritable when roused. It is noted that within a few hours of an injection under the skin of 8 ounces of normal saline with 1 grain of caffein benzoate, there was improvement. For seven days the same injection was daily repeated and at the end of that time the child was free from all intoxication. Four days later he developed a bronchopneumonia, but in spite of the serious intoxication and weak heart present in the earlier stages of the disease, the boy passed through the lung involvement with an increasingly good pulse and was dismissed in perfect health on the thirty-sixth day after admission.

Of drugs, caffein, camphor and ergot are the most useful. Camphor should be given hypodermically, dissolved in sterile oil. If the case is urgent the combination of camphorated oil with ether is to be advised, 20 minims of the oil to 2 grains of camphor and 10 of ether. The action of the camphor is evanescent and 20 minims of the oil, or 1 to 2 grains of camphor, should be given an adult as an initial dose, with a repetition of 10 minims of the oil or 1 grain of the drug every two hours, until the pulse becomes regular both in force and rhythm, the blood pressure heightened and the cyanosis diminished. I have never seen camphor do any harm, not even in those instances of acute nephritis which sometimes occur, and in which one might anticipate that any member of the turpentin group would be injurious. Adrenalin has been highly recommended by Rolleston. He insists that it should be given from the time that the case is first seen in increasing doses of the 1-1,000 solution. He dilutes it with aqua camphoræ, making a dram contain 5 minims of the adrenalin solution. He increases his doses daily until at the end of five days the patient is taking 15 minims of the adrenalin chlorid. Some time ago we tried this plan. We have not been able to see that the adrenalin did the least good, and in one instance an adult patient developed a marked pseudoangina which entirely disappeared on the withdrawal of the drug. Strychnin, which is so lauded by a number of writers, I believe to be not only useless as a therapeutic agent in conditions of acute heart failure, but to be a distinct detriment to many patients. It exalts the sensorium and is therefore contraindicated whenever restlessness is marked, and in children its exhibition not infrequently causes extreme abdominal pain and sometimes vomiting, both of which should be avoided.

There are cases in which the failure of the circulation seems to be due more to the vasomotor disturbance, with resulting low blood pressure, than to the weakening of the heart muscles or disturbances of its control. Such cases present a characteristic clinical picture. The patient may be more or less cyanosed; usually the cyanosis is hardly noticeable during recumbency. It may be limited to a slight bluing of the nails and lips. The heart is regular, the first sound at the apex is weak, but otherwise unaltered. The relation of the sounds at the apex is as usual. The second pulmonic is only slightly, or not at all, accentuated. This in recumbency. The picture changes when the patient is raised in bed. The heart begins to race, the sounds of the heart approach each other in length and tone at the apex. A momentary pallor is followed by well-marked, rarely extreme cyanosis, most noticeable about the lips, cheeks and nails. The radial pulse becomes weaker, sometimes its beats are barely perceptible, and it may give a false idea of irregularity which is not borne out by auscultation of the heart. If the patient has been sitting up for a few minutes he may complain of extreme fatigue. Such cases will respond with remarkable alacrity to the exhibition of fluid extract of ergot given in from 5 to 15 minims doses according to age. A similar condition sometimes supervenes in typhoid in children and is equally amenable to treatment by ergot. The ice bag has proven of much use in those cases which rarely occur, but are alarming when they do, in which the heart is wildly and forcefully beating with rapidity.

It becomes important when confronted by a case of diphtheria with marked heart involvement to decide when to use local treatment and what treatment to use. The early and forcible removal of membrane is to be deprecated. In adult cases it is better to attempt only to keep the fauces clean. This is best done by irrigations at two or three hour intervals with warm alkaline lotion 1 ounce each of borax and bicarbonate of soda to the pint, to which may advantageously be added ¼ to ⅓ volume of hydrogen peroxide. In the case of children it is better to wait until the nurse has gained the patient's confidence and even to abandon attempts at local treatment if the child persists in resisting. Usually, however, even the youngest children come to like the cleansing process, after realizing the comfort it brings them. This is especially true in naso-faucial cases with blocked nostrils and swollen fauces. With a small male catheter and warm alkaline solution *without the peroxide* a skillful nurse can, in most cases, keep the nasal way fairly clear after the antitoxin begins to soften the membrane. The child is laid on its side with its head on a high pillow with the mouth open and both nostrils and fauces are washed through.

From personal experience I can testify there is nothing more comforting than a thorough cleansing of the fauces and nostrils when one has diphtheria, unless it be a spraying with 2 per cent. iced carbolic acid lotion that should follow the washing when the throat is painful. The icing of liquid food is a comfort, as is an ice collar applied to the throat. Some patients, however, like hot applications better.

The limits of this paper make it impossible to touch on the thoracic complications that may follow tracheolaryngeal diphtheria or on the treatment of the diphtheritic paresis and ataxias.

I would, however, like to call your attention to one practical point. We have an early paralysis of the vocal cords in pharyngo-tracheal diphtheria that is unquestionably due to local damage. In many instances it arises from an edema of the tissues around the larynx; it especially affects the posterior arytenoid muscles and prevents the tensing of the swollen cords. This condition can be remarkably ameliorated by the use of an adrenalin and cocain spray, 2 per cent. cocain in 1-1,000 adrenalin, used several times daily. Occasionally the pharyngeal constrictors are affected early, more often they are not attacked until the third or fourth week of the disease as a result of neuritis. In either event, when difficulty in swallowing eventuates, I have found that by putting the patient prone with head lowered and extended, in fact, in the position devised by Casselberry, of Chicago, for feeding intubated children, that liquid or semi-liquid food can be swallowed. Since making this discovery we have not found it necessary to feed by nasal tube, as we formerly did. For adults and older children it is best to feed milk and egg mixtures, slightly thickened with cornstarch or flour.

The treatment for the pareses, whether of palate, eye, leg or diaphragm, sums itself up in the formula: rest in bed, food, iron and arsenic, fresh air and sunshine.

The essentials of treatment for the heart condition accompanying diphtheria are:—

(1) Prompt and sufficient dosage of antitoxin.

(2) Rest in bed not less than three weeks.

(3) Attention to the condition of the abdominal viscera.

(4) A nutritious, easily digestible diet.

(5) Certain drugs each according to the indications. For a slow heart, atropin. For a racing heart, camphor, and ice to the precordium; for vascular failure, ergot.

(6) If the heart failure is incidental to an overwhelming toxemia with lethargy, hypodermoclysis.

Finally the factors determining the number of units of antitoxin to be given are:—

(1) The intensity of the toxemia.

(2) The extent of the involvement.

(3) The time elapsed since the first manifestation of the disease.

(4) Whether or not there is stenosis of the air ways.

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THE PATHOLOGY OF THYMIC HYPERPLASIA AND THE STATUS LYMPHATICUS.*

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The term *status lymphaticus,* as introduced into clinical use by Paltauf and his followers, is utilized to convey the conception of a *peculiar condition of lowered constitutional resistance predisposing to sudden death, either spontaneous or as the result of relatively slight causes.* As the chief anatomic stigmata of this predisposition are regarded hyperplasia or persistence of the thymus, hyperplasia of the lymphoid organs, particularly of the tonsillar ring and lymphoid tissue of the intestinal tract, hypoplasia of the arterial system, various cardiac lesions such as hypertrophy, dilatation and thickening of the endocardium, rachitis, the "pasty habitus" and other less well-defined peculiarities of bodily structure. Individuals showing this complex are regarded as especially susceptible to physical and psychical shocks, infections and intoxications. Spontaneous sudden deaths or sudden deaths following anesthesia, during bathing, after the use of certain drugs, injection of antitoxin, hypodermic injections, slight burns, trivial injuries, or surgical operations, slight infections or intoxications, nervous shocks, etc., both in adults and in children, have been ascribed to this peculiar constitution; and the status lymphaticus has won for itself a position of some medico-legal importance. In the case of infants found dead in bed the suspicion of "overlying" either accidental or intentional, has been quieted by a diagnosis of lymphatic constitution, and the same diagnosis has probably been given somewhat hastily and upon inadequate grounds in explanation of sudden death under unexplained or suspicious circumstances. In England, Dudgeon has warned against the too hasty diagnosis of lymphatic constitution in infants, and similar warnings have been given in Germany.

Clinically the lymphatic constitution has assumed a position of decided importance, both in surgery and in general medicine. In the former it comes under consideration particularly with reference to the question of anesthesia and shock. In the case of certain infectious diseases, particularly diphtheria and epidemic cerebrospinal meningitis, the condition of status lymphaticus is regarded by some clinicians as a factor of great importance in so far as the mortality from these conditions is concerned. Other clinicians regard the lymphatic constitution as an expression of a congenital disturbance of the lymphatic system predisposing particularly to tuberculosis. (Bartell.) Epilepsy, exophthalmic goitre, myasthenia gravis, cretinism, infantilism, and various other affections have also been regarded as holding some close relationship to the lymphatic constitution. Some observers claim that the physical characteristics of the constitution are so decided that it can be recognized on sight, even by the untrained eye of the layman.

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A study of the reported cases in the literature reveals, however, that the term lymphatic constitution is but a collective designation for various conditions *more or less frequently associated with sudden death, and that the essential pathology and etiology of the complex are unknown.* Further, we find various authors expressing doubt concerning the existence of a distinct pathological entity for the lymphatic constitution. Some writers frankly regard it as an hypothesis. Particularly in the case of children has the assumption of a lymphatic constitution as a distinct and separate entity been carried to an extreme. Kolisko, in 1906, warned against the danger of assuming the existence of a lymphatic constitution in young children, particularly in connection with medico-legal cases. The pasty habitus, the lymphatic enlargement, adenoids and tonsil complex, etc., that taken together might give the impression of such a constitutional anomaly may in many cases be simply the expression of a rachitis, or of a concealed slight infection, such as eczema, bronchitis or gastrointestinal disturbance. Therefore some writers would limit the use of the term lymphatic constitution to adults, regarding the constitutional anomaly as one acquired during the period of development, since the persistent thymus, aortic hypoplasia, etc., are conditions that are not congenital but appear only later during the period of development (from the seventh year to puberty). Von Sury holds that the diagnosis of a lymphatic constitution during early childhood is very difficult and should be made only with the most extreme care, in fact only after autopsy, basing his final conclusions as to the distinct pathological entity of lymphatic constitution upon the demonstration of a *hypoplasia of the chromaffinic system.* Inasmuch as such a hypoplasia of the chromaffinic tissues has been observed only in a few cases (Wiesel, Hedinger, von Sury), its use as the final criterion of the existence of a definite entity for the lymphatic constitution cannot be regarded as a very satisfactory foundation for the support of such a claim. As von Sury points out, if a lymphatic constitution does exist in young children, it shows essential differences from that in adults, both in so far as the cardiac and circulatory anomalies are concerned; and the two conditions can be shown to be the same only through the demonstration of a chromaffinic hypoplasia which von Sury accepts as the one pathological finding placing the hypothesis of the lymphatic constitution upon a more secure foundation, although the etiology and pathology of this chromaffinic hypoplasia are wholly unknown, and the ultimate nature of the condition, therefore, still wholly obscure. As I have pointed out the chromaffinic hypoplasia which has been observed in a few cases only may be purely a coincidence and is a very weak foundation upon which to construct a definite pathological entity.

If we search for some common feature of all the cases of spontaneous sudden death, both in children and adults, regarded as due to the lymphatic constitution, two things stand out prominently: the anatomical finding of a hyperplastic or persistent thymus and the manner of death which is that of asphyxia or cardiac paralysis. About these two things centres at the present time the discussion concerning the nature of the condition, particularly with regard to the part played by the thymic enlargement. Is it the direct cause of death, or is it only a secondary feature of the condition? In the literature since 1900 there occurs a constantly increasing list of cases reported under the head of thymic asthma or thymic death, in which the observers believed the symptoms and the death to be caused directly by the enlarged thymus. Some of these cases showed the characteristics generally regarded as belonging to the lymphatic constitution, others did not. In all of the cases the main feature was the thymic hypertrophy, and in some instances this was the only thing noted. The careful examination of some cases before death, the exploration of the trachea (tracheoscopy), the relief afforded by intubation with a tracheal tube, the relief or cure following the resection or removal of the enlarged thymus, especial autopsy technique with particular reference to the demonstration of pressure effects in the structures underlying the thymus, etc., all of these clinical and pathological bits of evidence have again brought to the front the theory of a *mechanical thymus-death,* which, since the time of

Friedleben (1858) has been the subject of much controversy. To an impartial and fair-minded critic the literature of the last ten years would seem to offer positive proof of the occurrence of pressure symptoms due to an enlarged thymus. We must accept the existence of such proof or reject the published observations of such cases as inaccurate. Some writers, von Sury, one of the most recent, do this very thing. On the ground of his experience in the medico-legal institute in Vienna the latter writer rejects all cases of thymic death reported in the literature, as not being above criticism; and holds that sudden death in children cannot occur as the result of the mechanical effects of an enlarged thymus, and that in the cases so reported some other cause of death is to be sought, as, for example, in a hidden infection such as bronchitis or enteritis. He believes that there exists no proof of pressure by an enlarged thymus upon the vessels and nerves. Nevertheless, for the operative cases in which resection or removal of the thymus resulted in a cure he can offer no satisfactory explanation and coolly sets them aside. Such a sweeping rejection of the observations of other writers in turn excites suspicion of an unscientific method, and von Sury's statements are deprived of the power to convince. He does not stand alone, however, in his view opposing the theory of a thymus-death, but is supported by a number of other writers in spite of the rapidly increasing number of such cases reported. While it is true that some of the cases of so-called thymus-death have been imperfectly observed or incompletely autopsied, a large number of such cases has been reported by skilled and competent clinicians and pathologists. It would seem that sufficient evidence had been set forth to establish thymic-death as a definite pathological entity, but the controversy is still in such a stage that it becomes necessary to bring forward new and additional evidence in its favor. Further, it is highly essential that the condition of lymphatic constitution be given a definite pathological and etiological entity if such exist.

Enlargement of the thymus was noted early in the seventeenth century as a condition of anatomical interest. Kopp, in 1824, first gave to the condition a definite pathological interest as the cause of "asthma thymicum." His view was generally accepted until 1858, when Friedleben set forth his doctrine that there was no thymic asthma. During the thirty years following, Friedleben's dictum was generally accepted, although individual voices here and there (Hasse, Clar, Abelin, Virchow, Cohnheim, Rauchfuss, Baginsky, Somma, Jacobi, etc.) were raised in favor of the view that an enlarged thymus might cause respiratory disturbances or death. Grawitz, in 1888, opposed Friedleben's view and asserted the medico-legal importance of the condition. In 1889-90, Paltauf gave an entirely different turn to the question by his introduction into clinical medicine of the status lymphaticus as a definite clinical entity in which the thymus played no chief part, death resulting in all cases from cardiac paralysis. During the next ten years his views became widely accepted (Pott, Nordmann, Escherich, Galatti, Ewing, Ohlmacher, Daut, Klein, etc.), although a number of writers (Pott, Nordmann, Avellis, Klein, etc.) kept the thymic condition prominently in view, if not the most important feature of the condition. In 1900, Friedjung made a critical survey of the subject of lymphatic constitution and associated thymic enlargement, concluding that sudden death due to a hyperplastic thymus was extremely rare, and that the majority of the cases reported under this head were in reality instances of the status lymphaticus. The operative cases reported up to that time he regarded as offering practically the only positive evidence in favor of a thymic asthma, but concluded that it must be of extremely rare occurrence.

Since 1900, Rolleston, Taillens, Penkert, Caillé, Perrin de la Touche, Hochsinger, Zander and Keyhl, Tada, Rehn, König, Hotz, Jackson, Hinrichs, Hedinger, Huismans, Meyer, Hart, Warthin, Rich, Rubra, Lund, Bonnet, Winkler and others (over 50 cases in ten years) have observed instances of thymic enlargement, the symptoms or death being regarded as due directly to the thymic hyperplasia. The diagnosis in these cases rested upon the demonstration of evidences of pressure upon trachea, either clinically, at operation or at autopsy; or upon a similar demonstration of pressure upon the great vessels, nerves or heart; upon the occurrence of recovery or improvement after operation; or upon the autopsy signs of death from suffocation. When no proof of a mechanical thymus-death could be found the observers have had recourse to a theory of intoxication from *hyperthymization.* In the majority of these cases the complex of lymphatic constitution was present, but was regarded as accessory or secondary to the thymus condition. In fact, the majority of these cases have been reported under the head of thymus and not under that of lymphatic constitution.

For all of these cases von Sury finds reasons for rejection.

Only in so far as the operative cases are concerned is he in doubt, but even in these he thinks the relief or cure afforded may have been simply the result of a diminution of the intrathoracic pressure when the tracheal stenosis is due to the pressure of enlarged lymph-glands or a mediastinal tumor. The flattening of the child's trachea mentioned by many he does not regard as being of pathological significance, and finds a flattened trachea in many children showing no thymic enlargement. He also regards the thymus as an organ whose physiological activity is shown during extrauterine life and whose involution does not begin until puberty or shortly after it, so that the dimensions of many normal organs are often overestimated and regarded as pathological. He further rejects the usually accepted autopsy signs of "typical death from suffocation" (subpericardial, subpleural and conjunctival ecchymoses, punctate hemorrhages on the surface and within the substance of the thymus, cerebral hyperaemia, congested lungs, fluid blood in the heart, etc.) as having a medicolegal significance in so far as the cause of death is concerned, inasmuch as these findings are not characteristic of death by suffocation alone. In his experience at the Vienna Medico-legal Institute, von Sury has seen in 2,341 autopsies in children ranging from the newborn up to fifteen years of age no case that would justify a diagnosis of thymic death through pressure either upon the trachea, great vessels or nerves. As a result of this experience he does not believe that a thymus of normal size can produce a sudden death from pressure; and the thymic dimensions as given in the reported cases of thymic death he believes with very few exceptions to have been no greater than normal. In these cases the sudden death, according to von Sury's opinion, has resulted from an unrecognized bronchitis, enteritis or rachitis.

I have gone into von Sury's arguments against the occurrence of a thymic death with some detail since his paper represents the latest and most complete summing up on the negative side of the question. Without taking the space here to answer all of his arguments fully the following opinions may be advanced in opposition to his:—

1. The weight of the thymus normally is less than the standard usually given, and accepted by von Sury (Dudgeon, etc.)

2. The weight of the thymus is of much less importance than its thickness in so far as the question of reducing the space in the superior thoracic strait is concerned.

3. Undoubted cases of thymic enlargement causing pressure upon the trachea, esophagus and blood vessels have been observed, and the pressure effects positively demonstrated. For example, the positive evidence of tracheal stenosis obtained by tracheal exploration in the cases of Biedert, Jackson, etc.; the relief afforded by intubation with a long tube (Marfan), by operations reducing the volume of the gland (Siegel, König, Perrucker, Ehrhardt, Jackson), the expiratory pushing out of the thymus through an incision made in the suprasternal notch (Rehn), and the autopsy demonstration of a pathological flattening and atrophy of the trachea, compression of the great vessels, etc. (Flügge, etc.) Pressure upon the esophagus has been positively demonstrated by Hinrichs in a case relieved by operation.

It does not seem that an unprejudiced survey of the literature can lead us to reject the possibility of a thymic tracheostenosis causing stridor or death by suffocation. The majority of writers at the present time apparently accept such a possibility, but can this explanation serve for all cases of sudden death associated with thymic enlargement, particularly for those in which no autopsy evidences of abnormal pressure can be demonstrated in either the trachea or blood vessels? For the mechanical theory there remains still the hypothesis of reflex laryngeal spasm or cardiac paralysis due to pressure upon or irritation of the vagus. Various French writers in particular (Brouardel, Vibert, Cheinisse, etc.) hold that an enlarged thymus may irritate the tracheal nerves, increasing reflex excitability and acting upon the vagus centre to inhibit the heart. Positive proof of such pressure upon the nerves is manifestly very difficult to obtain, and up to the present time has not yet been demonstrated. Lerch has recently called attention to the occurrence of nervous symptoms in association with enlarged thymus.

The positive demonstration of a mechanical cause of death in some of the cases of thymic enlargement does not necessarily imply that it will explain all cases of sudden death associated with this condition. In the absence of such proof in a number of cases recourse has been taken to an explanation by a hypothesis of chemical action rather than mechanical; but in this quarter we are still in a field of pure speculation. Of the physiological significance of the thymus we are still in ignorance. That the gland is not a fetal organ, but that its chief physiological activity falls within the period of development between birth and puberty is clear. Between the sexual glands, the chromaffinic tissues, thyroid and thymus, there exist correlations of function only slightly revealed to us in experimental and clinical observations. That the organ has also some connection with blood formation is also evident in the frequent presence in the hypertrophic gland of myeloid tissue. Svehla attempts to explain the sudden death in cases of enlarged thymus in which no mechanical effects are found as due to an autointoxication caused by an increased or pathologically changed thymic function (hyperthymization). Hart develops the intoxication theory still farther to explain those cases of sudden death associated with a large thymus containing minute hemorrhages throughout the gland substance (*apoplectiform thymus death*). Such cases have occurred chiefly in adults. According to Hart the autopsy findings are not those of death by suffocation but represent a heart-death. On the grounds of a case carefully studied by him, Hart sees a close relationship between hyperplasia (persistence) of the thymus and Basedow's disease, and would explain the cardiac symptoms in the latter disease as possibly the result of toxic products arising from the thymus. It would be, therefore, more proper to speak of a "thymus heart" than of a "thyroid heart." Hart bases his theory upon the frequent occurrence of persistent thymus in Basedow's disease, particularly in the severe cases, also upon the resemblance to thymus death of the sudden death in Basedow's, and by experimental proof that extracts of the hyperplastic thymus can produce cardiac disturbances. That the thymic hyperplasia in Basedow's disease is not secondary is shown by the fact that the histology of the enlarged gland is identical with that of the thymus in infancy. Rössles has also advanced a similar idea concerning the relation of persistent thymus to Basedow's disease.

There is certainly strong reason for believing in a close relationship betwen thyroid and thymus, but of the exact nature of this relationship in so far as the etiology of Basedow's disease is concerned we know nothing. Is the primary lesion in the thymus or in the thyroid? Are thymus and thyroid antagonistic, or is the disease the result of a summation of thymus and thyroid action? We are not yet in a position to accept the theory that the apoplectiform thymic death in adults (lymphatic constitution) is an unrecognized Basedow's disease, even though such cases are frequently characterized by marked cardiac disturbances and the manner of death is cardiac. Should we accept such a view then

Basedow's disease becomes only a manifestation of the lymphatic constitution, in which the persistent thymus is a prime pathological feature; but not all cases of Basedow's present the general complex of lymphatic constitution, nor do all cases of hyperplastic thymus.

The view of Wiesel may also be considered here. In 2 cases of persistent thymus he found a marked hypoplasia of the chromaffinic tissues. Such a chromaffinic deficiency, he thought, might lead to a vascular and cardiac paralysis. Wiesel's findings have not been generally confirmed, although Hedinger and von Sury have found such a chromaffinic hypoplasia in lymphatic constitution but not in cases of thymic hyperplasia showing no other signs of the lymphatic constitution. Von Sury concludes that cases of thymic hyperplasia are essentially different from those showing the complex of the lymphatic constitution in association with such hypoplasia. But the evidence so far is not sufficient to warrant the use of this point as a means of differential diagnosis between thymic hyperplasia and lymphatic constitution, or to put the latter condition upon a secure foundation as a definite entity. The chromaffinic hypoplasia may be simply coincident with the other conditions.

Summing up the whole question we must believe in the occurrence of a true thymic asthma and thymic death, the latter being due often to a compression of the trachea resulting in an acute suffocation. In other cases the cause of death remains unexplained, the picture being that of cardiac death. The first form occurs chiefly in young children and infants, the second in adults. In the first case the symptom-complex of the so-called lymphatic constitution may or may not be present, yet by the majority of writers the thymic hyperplasia is assumed to be the cardinal feature of the status lymphaticus, only a few (von Sury, Wiesel and Hedinger) drawing a distinction between them. The uncertain state of these questions, so important from the medico-legal standpoint, invites to a full discussion of the subject and the observation and careful study of all cases regarded as thymic hyperplasia or status lymphaticus. Each new case should be studied with particular reference to the objections urged by von Sury.

But it is particularly along pathological and etiological lines that these cases demand investigation. If we sum up the pathology of those conditions from the literature we find a very unsatisfactory state of knowledge concerning it. General and vague statements are made concerning the gross features of the case, the size of the thymus, lymph nodes, great vessels, the condition of the heart, signs of rachitis, evidences of pressure, etc., but few careful and minute studies of the changes in all of the organs have been carried out. Paltauf, Ewing, Ohlmacher and other observers who have made histological studies describe the lesions as simple hyperplasias. Lartigau noted lesions in the spleen resembling those found in diphtheria and other infections. Blumer, who has made the most careful histological study of the condition up to the present time, found in the thymus a general hyperplasia of the lymphoid elements, associated at times with endothelial proliferation. In the lymph nodes, splenic follicles, tonsils and lymphoid tissue of the intestines he found a general hyperplasia associated with focal changes consisting of a proliferation of the cells composing the germ centres with slight degenerative changes in the proliferated cells. In the spleen a decided proliferation of the endothelial cells of the follicular vessels was noted. Blumer regards these lesions as resembling those seen in various infections, differing only in degree from the latter. Bacteriological examinations were negative in all cases. In conclusion, Blumer regards the status lymphaticus as a definite pathological entity, associated with or due to a condition of intermittent lymphotoxemia, the sudden death being the result of the toxemia or of the action of toxic, physical or psychic injuries rendered more powerful by the predisposing action of the lymphotoxemia, while in other cases the sudden death is undoubtedly mechanical, due to the pressure of the enlarged gland upon the trachea. The findings of Wiesel and Hedinger in regard to the chromaffinic tissues have already been mentioned.

Our knowledge of the pathology of the two conditions is therefore limited to these few observations. In view of the poverty of our knowledge concerning the subject it may be worth while to present here the following pathological study of a number of cases of thymic hyperplasia, in the hope of clearing up some of the obscurity surrounding the condition. These cases are collected chiefly from the autopsy material coming from the University Hospital, and in part from material coming to me privately in pathological consultation. Without going into the full details of each case they may be grouped as follows, and the essential points briefly given.

CASES OF THYMIC HYPERPLASIA.

I. *Cases Associated with Sudden Death.*

1. Female, aged forty-one, sudden death during anesthesia. Status lymphaticus. Persistent thymus. Cardiac death. No tracheal stenosis. Dilatation of heart; marked edema of lungs. Hyperplasia of lymph nodes. Atrophic spleen. No hyperplasia of aorta or chromaffinic tissue. Adrenal tumor in cortex of kidney. Thyroid not enlarged. Microscopically "lymphoid exhaustion" of lymph nodes and spleen.

2. Female, aged fifty, sudden death from "heart failure." Hemophilia. Icterus. Retroperitoneal hemorrhages. Status lymphaticus. Persistent thymus. General enlargement of lymph nodes. Atrophy of spleen. Atrophic and dilated heart. Small aorta. Adenoma of thyroid. Hyperplasia of red marrow. No hypoplasia of chromaffinic tissues. Microscopically a condition of "lymphoid exhaustion."

3. Female, aged thirty. Sudden death from "heart failure." Status lymphaticus. Thymus 7 cm. x 4 cm. x 2 cm. Weight 22 grams. Pressure effects upon great vessels. Extreme dilatation of heart and hypertrophy. Mitral insufficiency. Pulmonary edema. Colloid goitre. General lymphatic enlargement. Adrenals negative. Microscopically a "lymphoid exhaustion."

4. Female infant, eight days old. Sudden death from asphyxia. Tracheal stenosis. Congestion and edema of lungs with small areas of beginning bronchopneumonia. Thymus very large, consists of two separate lobes; right, 10 cm. x 3 cm. x 3 cm.; left, 7 cm. x 3 cm. x 3 cm.; weight 60 grams. Covers heart and great vessels. Lymph follicles of intestine prominent, all other lymph nodes very small. Spleen enlarged. Adrenals enlarged, congested. Microscopically "lymphoid exhaustion."

5. Male infant. Sudden death from asphyxia six hours after birth, preceded by tracheal stridor. Large and very pale thymus, 8 cm. x 6 cm. x 2½ cm. Weight 30 grams. No evidence of pressure on trachea found at autopsy. General enlargement of lymph nodes and spleen. No hypoplasia of chromaffinic tissues. Microscopically a "lymphoid exhaustion."

6. Female, aged twenty-six. Gonorrheal salpingitis. Thrombus in internal iliac vein. Pulmonary embolus. Sudden death from asphyxia. Status lymphaticus. Persistent thymus in mass of edematous fat. Left lobe of thyroid large. Adrenals small. General lymphatic enlargement. Microscopically a "lymphoid exhaustion."

7. Female, aged forty. Sudden death from cardiac insufficiency. Lipomatosis. Anemia gravis. Melanosis of the skin. (Addison's.) Hyaline areas of Langerhans. Atrophy or hypoplasia of hypophysis and adrenals. No goitre. Aorta negative. Cardiac dilatation. Persistent thymus. Atrophy or hypoplasia of all lymphoid tissues. Marked "lymphoid exhaustion" or hypoplasia.

8. Male, newborn. Sudden unexpected death from asphyxia. Very large pale thymus. Atelectasis of lungs. No direct evidence of pressure. Hypoplasia of medulla of adrenals. Congenital rachitis (?). Lymph nodes prominent. Microscopically "lymphoid exhaustion."

9. Male, aged forty-nine. Addison's disease. Sudden cardiac death. Status lymphaticus. Persistent thymus. No pressure effects. Extreme atrophy or hypoplasia of adrenals and semilunar ganglia. No tuberculosis of adrenals. Large goitre. Adenoma of thyroid. Aorta 7½ cm. Enlargement of all lymph nodes, particularly the hemolymph nodes. General atrophy or hypoplasia. "Lymphoid exhaustion."

10. Male, four weeks old. Spontaneous sudden death. Tracheal stenosis and stridor. Asphyxia. Pulmonary atelectasis. Thymus very large, not measured. Pressure upon trachea and great vessels. Thyroid and adrenals negative. Lymphoid hyperplasia.

11. Male, aged forty. Addison's disease. Sudden cardiac death. Large thymus, closely applied and adherent to pericardium and pulmonary artery; 9 cm. x 5 cm. x 2 cm., not weighed. Extreme atrophy or hypoplasia of adrenals and semilunar ganglia. No tuberculosis of adrenals. Complete absence of adrenal tissue on microscopical examination. Carotid and coccygeal glands not found. Thyroid not enlarged. Lymph nodes of stomach and mesentery hyperplastic. Microscopically a "lymphoid exhaustion."

12. Female, newborn. Death from asphyxia due to thymic hyperplasia. Marked stenosis of trachea. Thymus 12 cm. x 3.5 cm. x 1½ cm. Not weighed. Pulmonary atelectasis. No pneumonia. No aspiration. Congenital rachitis. Hypoplasia of all organs, particularly of lymph nodes; represented only by small collections of lymphoid cells. No germ centres. Hypoplasia of adrenals and sympathetic ganglia.

13. Male, three months old. Sudden death from asphyxia.

Icterus and cirrhosis (syphilis). Very large thymus, about 60 grams. Evidences of pressure on auricles, great vessels and trachea. Hyperplasia of all lymphoid tissues. Rachitis (?). No hypoplasia of chromaffinic tissues. Small blood clots found in trachea. Hemorrhage from tracheal mucosa. "Lymphoid exhaustion."

14. Female, aged forty. Clinical diagnosis of exophthalmic goitre, pseudobulbar paralysis. Sudden death from asphyxia. Very large thymus extending above sternum half way over thyroid, and below to diaphragm covering heart. Weight about 60 grams. Pressure upon trachea. No hypoplasia of aorta. Syphilitic aortitis. Early stage of cirrhosis of liver. No hypoplasia of chromaffinic tissues. Goitre, large adenoma of thyroid, no exophthalmic goitre. Tonsils and lingual nodes hyperplastic. Intestinal and peripheral lymphatics very prominent.

15. Infant, male, about eighteen months. Repeated attacks of stridor and dyspnea. Died in attack. Very large thymus (weight and measurements not at hand) causing tracheal stenosis. Rachitis. Lymphoid hyperplasia. Adrenals negative.

16. Infant, male, three months. Said to have been found dead in bed. Suspicious case. Very large thymus causing tracheal stenosis. Mother probably syphilitic. Child rachitic. Hyperplastic lymph nodes. "Lymphoid exhaustion."

17. Male, aged six years. Lymphatic status. Hyperplasia of all lymph nodes. Repeated attacks of severe dyspnea and cyanosis. Very severe attack in which he fell dead. Very large thymus. Rachitis. Enlargement of tonsils and lymph follicles of intestines. Adrenals hypoplastic. Thyroid negative. Microscopically a marked condition of "lymphoid exhaustion" and endothelial proliferation.

18. Male, aged five years. Cretinoid idiocy. Harsh stridor and cyanosis. Respiration rapid and harsh between attacks. Died suddenly in severe attacks after receiving a slight burn from a hot-water bag. Round swelling in suprasternal notch. Lymphatic status. No positive signs of rachitis. Thymus very large, reaching above to floor of mouth and below to apex of heart. Main body measured 7 cm. x 6½ cm. x 4 cm. Tonsils enlarged. Thyroid negative. Hypoplasia of medulla of adrenals. Hypospadias. Marked "lymphoid exhaustion."

19. Female child, aged two years. Slight rachitis. Enlarged tonsils. Repeated attacks of intestinal disturbance. Convulsions.

Attacks of stridor. Died suddenly in one of these after injection of antitoxin. Clinical diagnosis of diphtheria. Very large thymus, about 50-60 grams. Tracheal stenosis. General lymphoid hyperplasia. Adrenals negative.

II. *Thymic Hyperplasia in Cases Dying from Intercurrent Affections.*

20. Male, aged fifty-eight. History of syphilis. Death from bronchopneumonia. Persistent thymus, size of that of newborn. Adrenals and thyroid negative. Marked atrophy of spleen and lymph nodes.

21. Male, aged forty. Death from duodenal ulcer following appendicitis. Lymphatic status. Well preserved thymus. Rounded fat thighs and hips, very little fat over abdomen and trunk. No aortic hypoplasia. Hyperplasia of tonsils and all lymph nodes. Small adenomata in left adrenal. No hypoplasia of chromaffinic tissue. No goitre. Atrophy or hypoplasia of all organs.

22. Male, aged sixty-one. Carcinoma of stomach. Persistent lobes of thymic tissue, 2 cm. long. Below thymus a small accessory thyroid. No hypoplasia of aorta. Adrenals atrophic, induration of neighboring tissues. Thyroid normal. Lymph nodes atrophic.

23. Male, aged thirty. Acute leukemia. Lymphocytoma of mesentery and ileum. Persistent thymus. Thyroid and adrenals negative. Slight enlargement of peripheral lymph nodes. Lymphocytoma of all lymph nodes.

24. Male, aged eleven. Lymphocytoma of mesentery and intestines. Chylous ascites. Tumor of thymus. Pressure symptoms. Slight enlargement of peripheral lymph nodes. Lymphocytoma of lymph nodes. Adrenals negative. Rachitis.

25. Male, aged thirty-five. Malignant syncytioma of testis. Retroperitoneal dermoid cyst. Hypospadias. Hyperplasia of mammary glands. (Hermaphrodismus (?).) Persistent thymus. Colloid goitre. Adrenals smaller than normal. Hypophysis negative.

26. Male, aged forty-three. Case of traumatic myelitis, fracture of vertebra. Persistent thymus. No evidence of pressure. Adrenals negative. Spleen and lymph nodes atrophic.

27. Male, aged forty-five. Case of chloroma. Greenish masses in persistent thymus, largest, size of walnut. Chloromatous myeloid transformation of thymus.

28. Female, aged twenty-six. Cardiac death. Chronic pul-

monary tuberculosis. Small persistent thymus containing tubercles. Hypoplasia of aorta and adrenals. No goitre. Hyperplasia of all lymph nodes. "Lymphoid exhaustion."

29. Male, aged twenty-one. Gonorrheal endocarditis. Stenosis of aortic valves. Very large thymus. Two lobes measuring 5 cm. x 1 cm. x 1 cm. and 4 cm. x 1½ cm. x 1½ cm. No hypoplasia of chromaffinic tissues. Aorta small. Status lymphaticus. Large colloid goitre. Accessory pancreas in stomach wall. Hyperplasia of all lymphadenoid tissues.

30. Female, aged thirty-two. Acute miliary tuberculosis. Status lymphaticus. Large edematous thymus. No evidences of pressure. Tubercles in adrenals. No Addison's. Great hyperplasia of lymph nodes. No goitre. Marked hemosiderosis of spleen. Marked "lymphoid exhaustion" and endothelial hyperplasia.

31. Male, aged twenty. Typhoid fever, fourth week. Status lymphaticus. Thymus persistent. Thyroid enlarged. Hypoplastic aorta. Small external genitals. No hypoplasia of adrenals. "Lymphoid exhaustion," endothelial proliferation.

32. Male, aged fifty-five. Lymphocytoma of mesentery and ileum. Obstruction of thoracic duct. Chylous ascites. Large mass of lymphoid tissue in thymus region, lymphocytoma of thymus. Adrenals negative.

33. Male, aged thirty. Actinomycosis of lungs and vertebra. Persistent thymus. Status lymphaticus. Aorta dilated. No hypoplasia of chromaffinic tissues. Retroperitoneal lymph nodes enlarged.

34. Female, aged twenty-three. Typhoid fever. Bronchopneumonia. Colloid goitre. Persistent thymus. Status lymphaticus. Hypoplastic aorta. Adrenals negative. All lymph nodes hyperplastic.

35. Male, aged twenty-five. Colored. Acute miliary tuberculosis. Status lymphaticus. Colloid goitre. Persistent thymus. No hypoplasia of adrenals. Tubercles in cortex. "Lymphoid exhaustion" of spleen and lymph nodes.

36. Female, aged two and one-half. General tuberculosis. Status lymphaticus. Slight goitre. Adrenals negative. Large thymus, 8 cm. x 6 cm. x 1 cm.; weight, 30 grams. "Lymphoid exhaustion."

37. Male, aged about forty. Pernicious anemia. Status lymphaticus. Large thymus. No evidences of pressure. Adrenals negative.

38. Male, aged about forty-five. Persistent thymus. Mesenteric cysts. Complete hypoplasia of all peripheral and mesenteric lymphatic glands. Thyroid and adrenals negative.

39. Newborn female. Stillborn. Large thymus. Numerous ecchymoses in thymus and pericardium. Adrenals negative. Pulmonary atelectasis. Hypoplasia of spleen and lymph nodes.

40. Male, aged forty-seven. Acromegaly. Death from cardiac insufficiency. Hyperplastic thymus, hypophysis and parathyroids. Adrenals negative. No goitre.

41. Male, aged thirty. Congenital hemophilia. Died from "shock" from fall from carriage. Lymphatic status. Large thymus. Hypospadias. Adrenals and thyroid negative.

PATHOLOGICAL SUMMARY.

The one common especial pathological feature of all these cases is the thymic hyperplasia, absolute or relative, and the local or general changes in the lymphatic glands. No other feature. The hypoplasia of vessels and chromaffinic tissues, rachitis, goitre, etc., is characteristic of all the cases. They are all characterized, however, by a general hypoplasia, atrophy or cachexia—in other terms, they all showed a constitution below par. These changes will be considered in detail, as follows:—

(1) *Hypoplasia of Chromaffinic Tissues.*—This was found in 11 cases, 6 males and 5 females, 2 being infants, 2 boys aged five and six years, and the remainder being adults. Three of the cases were typical Addison's clinically. In our other cases of Addison's with tuberculosis of the adrenals no thymic enlargement has been noted.

(2) *Disturbances of Sexual Organs.*—Hypospadias was observed in 4 cases; hermaphrodismus (?) with malignant syncytioma of the testis in 1 of these cases, and infantilism in 1. As a general rule, the sexual apparatus was small in all adult cases.

(3) *Goitre.*—A well-marked goitre was found in 10 cases, 6 females and 4 males, all adults. In all cases the thyroid presented a colloid hyperplasia with adenomata. No changes characteristic of Basedow's were found.

(4) *Hypophysis.*—Hypoplasia of this organ occurred in 1 case. Adenomatous hyperplasia was found in the case of acromegaly.

(5) *Parathyroids.*—Negative in all cases, except the one of acromegaly, in which the parathyroids were hyperplastic.

(6) *Rachitis.*—Well-marked signs in the majority of young cases; suspicious signs in the majority of adults. In the case of the newborn a congenital rachitis was usually present.

(7) *Tonsils.*—More or less enlargement of tonsillar ring was noted in all cases in which the mouth and pharynx were examined.

(8) *Enlargement of Thymus.*—This characterized all cases. From the list given above I have omitted all cases in adults in which minute masses of thymus tissue were present, and have included only those cases in which the dimensions of the thymus mass were so marked that the organ could, by comparison with the infantile organ, be regarded as definitely hyperplastic or persistent. In all cases the enlarged organ presented the histologic picture of a simple hyperplasia of all the elements peculiar to the thymus, with the exception of those cases of leukemia, chloroma, lymphocytoma and tuberculosis in which specific changes characteristic of the given disease were also found. The general picture was that of a hyperplasia of the lymphoid elements with preservation or apparent increase of the corpuscles of Hassall. These were usually numerous and large. In the older cases the majority of the corpuscles showed advanced hyalin change and occasionally calcification, and were often very large. In other cases they resembled in all respects the corpuscles of the thymus of the young child, and in this respect the thymus may be said to have failed of its normal involution. In another respect this failure to undergo involution is shown in the almost constant presence of nucleated red cells, mononuclear eosinophiles, and giant cells, resembling those of the bone marrow, although frequently multinucleated. In some cases they resembled the endotheloid giant cells of the lymph nodes in Hodgkin's disease. The myeloid elements were found usually in the medullary portion of the lobules about the lymphoid tissue. Congestion, minute hemorrhages and edema were frequently present. Proliferation of the stroma and of the endothelium of the blood vessels were also fairly constant characteristics. There is nothing, however, in the histologic appearances of the enlarged thymus to indicate any pathologically altered function. If we can draw any conclusions as to the nature of the process it would seem to be that of a compensatory hypertrophy.

(9) *Lymphoid Tissue.*—In 2 cases, one an adult, the other a newborn infant, there was evident congenital hypoplasia of the lymphoid tissues. The adult showed in place of normal lymph

nodes a plexus of diluted lymphatic sinuses, in the walls of which small collections of lymphoid cells were found. No germ centers were present. The mesentery and intestine were studded with cysts of varying size corresponding to the dilated lymphatics. In the newborn the lymph nodes were represented by small collections of lymphocytes surroundings a lymphatic plexus. No germ centers were present. Both cases were interpreted as representing a hypoplasia of lymphatic structures. In the other cases the condition of the lymph nodes varied from a simple lymphoid hyperplasia to a marked atrophy of the lymphoid tissue with proliferation of stroma and endothelial cells. Transition stages were found in the glands of different regions in the same case. The striking common feature is a "lymphoid exhaustion." The cortex usually consisted of a narrow rim of lymphoid tissue, containing few or no germ centres. Lymphocyte formation appeared greatly diminished. The sinuses showed a marked "sinus catarrh," being blocked by large pale cells of the endothelial type lying in a fibrous reticulum. Similar cells of endothelial type replaced the lymphoid cords of the medulla. Mononuclear eosinophiles and pigment-containing phagocytes were not infrequent. Giant cells, resembling those of the bone marrow, or those found in the nodes in Hodgkin's disease, were occasionally found. Small hyalin areas were numerous in the nodes from the mesentery and retroperitoneal regions (old healed tubercles?). The blood vessels of the glands presented often a condition of obliterative proliferation of the intima. In general, the changes were those of a chronic lymphadenitis with marked proliferation of stroma and endothelial cells, such changes as are found frequently enough in lymph glands as the result of a chronic infection or intoxication. Some of the glands show changes suggesting a relationship to Hodgkin's. In others the lymphocyte exhaustion suggested that produced experimentally in lymph nodes by repeated exposure to Roentgen rays. The conclusion is, therefore, justified that in all of these conditions of hyperplastic thymus there is an extraordinary demand made upon the lymphoid tissues. The spleen in all cases shows the same changes even to a greater degree. There is a great poverty of lymphoid cells in the pulp, and the follicles are often so deprived of lymphocytes as to appear as whorls of epithelioid germinal cells, suggesting at first sight an epithelioid tubercle. Similar appearances can be produced in the spleens of the lower animals by repeated and prolonged exposure to Roentgen rays. The splenic reticulum is also relatively and absolutely increased and the walls of the vessels are thickened. These changes vary in degree in different cases, but the essential pathology is the same. The bone marrow may show a lymphoid hyperplasia or a similar lymphoid exhaustion, or transition stages may be found in individual cases.

(10) *Changes in Other Organs.*—These are not constant in degree or kind. Atrophy or hypoplasia, chronic congestion, increase of stroma and parenchymatous degenerations are frequently found. Edema of the lungs is a constant occurrence in the adult cases. Localized hemorrhage and edema are also frequent. Bronchopneumonia in an early stage is not infrequent. In the younger cases the panniculus is usually abundant, particularly over the thighs and hips. The variations in the general pathological picture are so great as to constitute an argument against a specific entity for hyperplastic thymus and status lymphaticus.

(11) *Evidences of Pressure.*—Fourteen of the cases presented evidences of pressure upon the underlying structures, chiefly in the form of tracheal stenosis, marked flattening, adhesions, atrophy, anemia or hemorrhage. In only 2 adults were definite evidences of pressure found.

CONCLUSION.—The changes noted in the lymphoid organs are essentially the same as those described by Blumer as occurring in his cases of status lymphaticus, and I have independently accorded them the same interpretation in a somewhat broader application (*Transactions of Association of American Physicians*, 1906). The "lymphoid exhaustion" indicates an extraordinary demand made upon the lymphoid tissues during the period of development. In a mild degree such a demand may cause simply a compensatory hyperplasia of the lymphoid tissues—later the stage of "exhaustion" or atrophy sets in with a hyperplasia of reticulum and endothelioid cells. To my mind there can be but one explanation of this and that is a chronic lymphotoxemia. Blumer came to a similar conclusion. Just what the nature of this chronic lymphotoxemia is we are not in a position to say. It is, however, not at all necessary to believe that it is a specific infection or intoxication. It may be a feature of rachitis, syphilis, tuberculosis or any other hidden or latent chronic infection, making demands upon the lymphoid tissues. Infections of the tonsils, mouth breathing, gastrointestinal infections, etc., may also be the source of such an intoxication. In fact, I have seen cases diagnosed as hyperplastic thymus (enlarged percussion area, suprasternal prominence when head was thrown back, attacks of stridor) apparently recover after removal of infected tonsils and proper hygiene.

What is the relationship of the thymus hyperplasia to the exhaustion of the other lymphoid tissues? I believe it is a compensatory process, in part for the lymphocyte formation and in part for the constitutional disturbance. There can be but little doubt that the thymus plays an important part in the prepuberty period of development, and that its function is correlated with that of the thyroid, sexual glands and possibly adrenals. There is good reason for believing that the development of the bones is also dependent upon its function. Therefore, in the case of any disturbance of the functions of the lymphoid tissues, blood-forming organs, thyroid, adrenals, sexual glands and of bone formation during the period of development we may expect a compensatory enlargement of the thymus. Even if we know nothing about the nature of the thymus function this much seems to be true, if we may base any conclusions upon numerous observations supporting such a view.

In the case of a lymphotoxemia occurring during infancy, with its accompanying results in the checking or altering the normal development of the body, the thymus function may be called upon to such a degree as to render the organ markedly hyperplastic. Should the intoxication persist, or should the disturbance of development be a lasting one, the thymic hyperplasia may persist to old age. Such a lasting hyperplasia would be most likely to occur in those cases in which the development of the thyroid, chromaffinic or sexual system is retarded, and the collected cases of status lymphaticus show such a relation in a remarkably high proportion of cases. Moreover, a chronic lymphotoxemia or a disturbance of development and function of the organs mentioned would create a peculiar predisposition with weakened resistance to infection and an unusual ability of cardiac function (thyroid and adrenal disturbances) with an especial tendency to cardiac paralysis. Further, the hyperplastic or persistent thymus may cause a hyperthymization (thymic heart death). And just these two things especially characterize the status lymphaticus.

Without taking more time to advance further arguments on this side of the question my opinion concisely expressed is as follows:—

(1) The status lymphaticus, or the condition of thymic hyperplasia, has no specific pathologic entity. It is a collective pathologic-complex.

(2) Hyperplasia of the thymus (aside from leukemic, lymphocytomatous, tuberculous and other enlargements) is an expression of a *hypoplastic constitution* associated with, or dependent upon, a chronic lymphotoxemia or a congenital hypoplasia of the lymphoid tissues, or an altered function or disturbed development of the thyroid, adrenals, sexual glands or osseous system occurring during the period of development.

(3) The hyperplasia of the thymus is compensatory in nature. It constitutes the most important feature of the conditions grouped under the complex of status lymphaticus.

(4) In young children the hyperplasia of the thymus is the most prominent feature. At puberty, and after, the constitutional hypoplasia that has been styled the status lymphaticus becomes more prominent. The two conditions are essentially the same and borderland cases of all stages and degrees occur.

(5) In young children and more rarely in adults the hyperplastic thymus may cause a mechanical death from pressure, chiefly upon the trachea, but also upon great vessels and nerves. This is probably the most common cause of the so-called thymus death in infants and children. In adults cardiac death is the rule, as a result most probably of disturbed correlation of thymus, thyroid and adrenal function. The occurrence, however, of thymic stridor, thymic tracheostenosis and mechanical thymic death has been demonstrated beyond all doubt.

(6) The underlying lymphotoxemia and its cause may also cause death directly or indirectly. The lymphotoxemia and general hyperplasia create an especial susceptibility and lowered resistance to infections.

(7) The true nature of thymus hyperplasia will be revealed only when the function of the thymus and its correlations are made known to us.

BIBLIOGRAPHY.—For the most recent bibliography see von Sury, *Vierteljahrschrift für Gerichtliche Medizin,* 1908.

Illustrations of the changes in lymph nodes and spleen can be seen in an article of mine in the *Transactions of Association of American Physicians,* 1906.

EDITORIAL.

THE VACUUM BOTTLE AND THE BABY'S FOOD.

Elsewhere in this issue Dr. Tuley cites an instance of the danger to be apprehended in the use of the vacuum bottle, as the advertisements so strongly recommend, to keep food warm for the baby until feeding time. The increase noted in the bacterial count from 3,500 per c.c. in the control to 1,400,000 in the food kept warm in the "labor saver" shows what a beautiful incubator is this particular apparatus and, indeed, suggests a method by which a physician could grow his throat cultures without purchasing an expensive outfit. This excellence as an incubator is, however, a dangerous fault which is shared by all the "coseys" and "warming pockets" advertised so extensively and with such graphic illustrations. Mothers should be made aware, as they most certainly are not now, that the beautiful pictures in which one parent is shown pouring so quickly from one of these contrivances the already warmed food with its high bacterial content that the crying infant has no chance to disturb the other peacefully sleeping parent, depict a very dangerous proceeding; and, in view of the probability of wakeful nights from ailing children, one which will not result in much labor saving.

However, in the transportation of food when travelling, the vacuum bottle possesses some very great advantages. Food can be carried in ice-boxes, of which there are several on the market, but ice-boxes have to be refilled and ice-boxes are clumsy. Food suitably prepared from clean milk can be cooled and placed in vacuum bottles with the certainty that it will keep cold a much longer time than the ordinary journey requires. It is, of course, necessary for the bottles to remain unopened to retain approximately their original temperature, but even if opened once or twice they will not become much warmer if not left unstoppered longer than is necessary for filling a nursing bottle. And the loss in coldness may be compensated for by packing in ice and salt to get a very low original temperature before pouring into the bottles at the time of starting. In this case, care must be taken to keep the food stirred up while it is cooling to prevent its freezing and becoming ice-cream. If the journey is to be a long one it is best to allow only two feedings to a vacuum bottle, so that there may be but one opening and restoppering.

Heating the feeding bottles *en route* is easily done by using a small alcohol stove and one of the bottle heaters on the market. Such a heater holds the bottle surrounded by a thin film of water and is equipped with a reflector which concentrates the heat on the bottle holder, so that a cold bottle may be heated to the correct temperature for feeding in a minute or less. Clean bottles and clean nipples may be carried wrapped separately in sterile gauze and used as required.

Such an outfit, vacuum bottles, alcohol stove and bottle warmer, is not inexpensive, but each piece of apparatus has its use at other times than when the baby travels, and it is only then that he requires such a luxurious equipment. Indeed, on many an excursion the older members of the family, as they pour out hot or cold drinks from these very useful bottles, may rejoice that they were bought for the purpose of carrying the baby's food safely and easily.

SUDDEN DEATH IN SCARLET FEVER.—A. Gouget and Dechaux (*Presse Méd.,* February 24, 1909) say that unexpected death may occur at any period of scarlet fever, in adults as well as in children. It may occur after a sudden onset, with vomiting and convulsions, before there is any sore throat and before the eruption has had time to appear. Diagnosis is very difficult in these cases unless they occur in the middle of an epidemic. In the midst of perfect health convulsions may end in death after a few hours. In other cases the fever takes its regular course and the only disquieting symptom which precedes sudden death is a very rapid, thready pulse. Sudden death in the nephritic period of the disease is quite frequent. Autopsy does not help in explaining these cases, since nothing is found postmortem to account for the death. There are several theories as to its causation: that the poison overwhelms the nervous system or the heart or that there is some lesion of the suprarenal capsules. As to the last-mentioned theory, we have no corroborating evidence, since these structures have rarely been examined in scarlet fever. As yet we have no certain explanation of these cases and no method of preventing them.—*American Journal of Obstetrics.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held April 15, 1909.

Dr. John A. Wyeth, President.

THE PATHOLOGY OF THE STATUS LYMPHATICUS, WITH LANTERN DEMONSTRATION.

Dr. Aldred Scott Warthin, of the University of Michigan, was the guest of the Section and addressed the Academy on this subject. (For Dr. Warthin's paper see p. 597.)

Dr. L. Emmett Holt discussed the clinical features of the status lymphaticus, and said that he was not quite in accord with what Dr. Warthin had stated regarding the clinical aspects of the disease. His own experience with cases of enlarged thymus in status lymphaticus had been with a somewhat different class of patients, viz: in infants from four to eighteen months of age. In these children the clinical manifestations were quite different from the picture Dr. Warthin described as occurring among the older children. To illustrate, he related the following case:

An infant of three months, weighing six pounds, had been a very difficult child to feed, and had been under his observation for one month on this account. During this time the baby had appeared to be perfectly well, except for symptoms referable to the digestive tract. The digestion improved and the baby gained two pounds in weight. At ten o'clock one night the child vomited and seemed quite ill. At three o'clock the next morning the child was in collapse, cyanotic, with a temperature of 103° and respiration of 100 per minute. Dr. Holt saw the child a few hours after, the same symptoms persisting. There was intense prostration, moderate dyspnea, but no stridor, and a marked gaseous distention of the abdomen, which was relieved by the passage of a stomach tube. The child did not rally from this condition, but died thirteen hours after the first symptoms. There were no convulsions, but extreme restlessness. The autopsy showed acute congestion of the lungs with beginning bronchopneumonia, the general lesions of the status lymphaticus, together with an enormous thymus closely resembling the one, the picture of which had been thrown upon the screen by Dr. Warthin.

Most of the cases Dr. Holt had seen were of the type mentioned. They were children slightly rachitic or who had been regarded as previously healthy, and even when under observation for some time had shown no symptoms whatever referable to the thymus. From some apparently slight cause most severe symptoms suddenly developed, usually followed by death in from twelve to twenty-four hours. The associated condition which had most frequently seemed to act as a cause which precipitated the attack was acute bronchitis, or bronchopneumonia; in several cases it was the beginning of some acute infectious disease. Four symptoms were usually present in such cases in the terminal stages of the disease: intense prostration, dyspnea and cyanosis, convulsions, and fever, which was often high. The dyspnea, so far as he had observed it, was seldom of the obstructive type. One case he recalled which was under observation for thirty-six hours, during which time there were several attacks of dyspnea of great severity. Intubation gave no relief. In that case, although he was satisfied that he was dealing with an enlarged thymus, he endeavored to map the thymus out by percussion, but found it impossible to do so satisfactorily. He had tried to do this in other cases in infants when he felt certain that the thymus was enlarged, but had failed; and yet at autopsy an enlarged thymus was found to be present. He believed, therefore, that in infants at least, to map out an enlarged thymus by percussion was an uncertain procedure. He did not think it could always be relied upon.

Children suffering from status lymphaticus certainly had very feeble resistance and showed great susceptibility to many adverse conditions. In them the slightest thing, a small wound like the prick of a needle, anesthesia, acute indigestion, as well as the beginning of some acute illness, such as those forms above referred to, seemed sufficient to disturb the delicate balance and to precipitate the fatal attack. He thought that the great prostration, the extreme restlessness, cyanosis, convulsions, etc., pointed to a toxic condition rather than to mechanical obstruction.

Dr. Holt thought it often hard to reconcile the clinical picture with the pathological findings. It did not seem to him that the symptoms produced by this condition were usually due to pressure. A thymus as large as those often found at autopsy and encroaching upon the small anterior mediastinal space, if it could cause pressure symptoms, ought to have produced these, at least in some degree, before the final attack. It was conceivable, of course, that the former pressure might suddenly be greatly increased; but this did not seem a very satisfactory explanation. He certainly could not accept the obstructive theory as being applicable to all cases of status lymphaticus, especially in young infants. It was not an extremely uncommon condition. At the Babies' Hospital one or two examples usually appeared in a year, among about 120 autopsies. The condition was often, but not always, associated with rickets. In the majority of the cases he had seen children had shown no symptoms of any abnormal condition present up to the time of their final attack. The enlargement of the external glands noted in the older children he had not found to be common in infants.

Dr. Joseph A. Blake discussed the surgical aspects of the status lymphaticus and said he was interested in the view taken by Dr. Warthin, which was contrary to the one he had hitherto held. Some six or seven years ago he was unfortunate in meeting with several cases of sudden death, which were attributed to the status lymphaticus, in all 8 were seen at Roosevelt Hospital in one year. Since that time no cases had come under his observation. These cases of sudden death occurred in connection with anesthesia; in 4 cases coming under his immediate observation death occurred suddenly either during or shortly after the giving of the anesthetic. In none was there any intimation or suspicion of the presence of status lymphaticus. All these patients died without symptoms of obstruction to respiration, the patients seeming to go into collapse and to die from heart failure. There were, in fact, no respiratory disturbances. In one case, a child three or four years old, death occurred twenty-four hours after the anesthetic was administered, the patient dying in coma. It is possible that in this instance death was due to necrosis of the liver resulting from the anesthetic, although on autopsy the signs of status lymphaticus were found. One patient died at the end of an operation for Graves' disease; while the bandage was being applied, after the patient had gone through the operation well, the heart failed, respiration ceased and death occurred within a few minutes. The patient was an adult and at autopsy a thymus weighing 135 grams was found, one of the largest ever removed; this patient was twenty-five or thirty years of age. Although this patient had a very large thyroid as well as thymus, there was no interference with respiration. There had been mention in the literature of several cases of so-called thymic asthma with obstructive symptoms, which had been apparently cured by an operation which could be termed thymopexy, *i.e.,* not removing the thymus, but stitching it up to the manubrium so as to relieve tracheal compression. In these cases the condition might be regarded as being due to pressure. With regard to intubating these patients, to relieve this condition, it was brought out a few years ago that the tubes would not pass the thymus unless they were extremely long.

A point that interested the surgeon was the choice of anesthetics in cases of status lymphaticus, and, also, the question of performing an operation in these cases. The diagnosis was so uncertain that it was almost impossible to refuse to operate in conditions that demanded operation. But when only a minor operation was called for, that is, an operation that was not a necessity, such as the removal of adenoids or tonsils, it should be avoided. In those cases one should surely hesitate. With regard to the choice of an anesthetic, it was known that most of the reported cases died under the administration of chloroform. Three of the four deaths under his observation had occurred from ether narcosis. It was questionable which was the most dangerous anesthetic to use in these cases, but in his experience death had occurred from cardiac failure and, therefore, he preferred to give ether in such cases and not chloroform. At the same time it might be said that some of the deaths during the administration of chloroform, attributed to the status lymphaticus, might be due to the effects of the chloroform upon the liver.

Dr. A. Jacobi believed that cases of sudden death during status lymphaticus were not always due to that cause alone, and one of the cases described to-night showed at autopsy an extensive bronchopneumonia; in this case the respirations numbered 100 per minute, with a marked increase in temperature, vomiting, etc. They should not forget that the blood vessels of the lungs were enlarged, but the blood vessels in the neighborhood as well.

So far as the surgical aspect of these cases was concerned, Dr. Jacobi recalled an operation performed by Rehn at Frankfort-on-Main in 1893 or 1894; in this case the thymus was not removed, but was stitched to the anterior wall. Two years later Koenig operated in the same way and with a good result. There were a number of such cases now on record. During the past two months he said he was sure that he had seen the report of a case in which a favorable outcome was obtained by the removal of the entire organ.

There was one point that should not be lost sight of; the space between the sternum and the vertebral column was a narrow one, indeed, only 2.2 cm., and slight changes in the size of the blood vessels were likely to give rise to an obstruction to respiration, and to such an extent that even death might occur. Dr. Jacobi said he had observed, as others had, that in such cases occurring in children, if the head was forcibly bent backward or if the babies were lying in an uncomfortable position, the difficulty in respiration was removed by bending the head forward, which facilitated the circulation.

So far as the diagnosis of the enlargement of the thymus was concerned, it was not so difficult as it appeared to some, and those who saw these cases often enough might easily make a diagnosis in the majority of them. When one saw a baby lying on the back one could not detect the thymus gland; but if the baby was turned over and raised gently the thymus would be found. Dullness behind the manubrium was quite characteristic of enlarged thymus. He recalled his first case of this nature; he was called to see a baby who was said to be in great danger; when he arrived at the house the baby had just died. He tried to detect the thymus when the baby was on its back, but could not; turning the baby over, however, enabled him to readily detect this organ. When the child was put back upon his back he could not find the thymus; turning him over again the thymus was again readily detected. Difficulty in rspiration, occasionally convulsions, and sudden death might result from status lymphaticus, partly from an hypertrophy and partly from congestion of the thymus.

Dr. John A. Wyeth, in discussing the paper, referred to an article by Dr. W. Humes Roberts, of California, published in the *Laryngoscope* for 1908, in which paper was reported a series of 7 cases of death occurring in children who were operated upon for adenoids, and in which, postmortem, the condition of status lymphaticus was demonstrated. These cases ended fatally under the anesthetic or immediately after the operation, and in each instance the thymus was found to be enlarged.

There were also narrated a series of 30 cases of status lymphaticus, which ended fatally during narcosis. In 17 of these, chloroform was the fatal agent; in 6, ether; chloroform and ether (mixed), in 5, and 2 under nitrous oxide gas.

Dr. Wyeth's personal experience was confined to a single case. The patient, a boy of eleven years, came to his College Clinic two hours after eating a hearty meal. The child had received an injury on the ring finger of the left hand, from which had resulted infection, lymphangitis and a metastatic abscess in the epitrochlear region at the elbow. Although the child had a temperature of 101° he did not complain of any special pain; there were no appreciable lymphatic enlargements in the neck or elsewhere, and nothing in the action of the heart or in the general appearance of the patient suggested status lymphaticus. It was deemed proper to incise the abscess at the elbow, and for this purpose chloroform was given. Dr. Wyeth personally superintended the administration of the anesthetic, and only used chloroform in this instance because it was thought less likely to produce nausea and vomiting so soon after the ingestion of solid food. When the first stage of anesthesia ensued a single incision was made, the abscess cavity mopped out with gauze and the anesthetic discontinued. With its discontinuance the child gave a gasp, the pulse ceased at the wrist, and all efforts at resuscitation, which were kept up for half an hour, were without result. The child had died instantly from heart paralysis. At an autopsy, made by the coroner, there was no report of an enlarged thymus gland. The glands of the mesentery were enlarged and soft. The physician who made the autopsy pronounced the cause of death due to chloroform, the patient suffering from status lymphaticus.

Dr. John Howland said that upon a subject so unsettled as status lymphaticus there was room for much discussion, and it was in regard to the causes of death and the evidence of compression that there had probably been the greatest difference of opinion.

There was, as Dr. Warthin had stated, a sharp division into two camps—those who did, and those who did not, believe that pressure caused death. Dr. Warthin's views placed him unreservedly with the first class. That evidences of compression had been found at autopsy was undoubtedly true, but such observations had been extremely rare and the great majority of pathologists who had looked for it carefully had failed to observe it. Friedleben, Paltauf and Richter expressly stated that they had never seen it, and Paltauf dissected the trachea from above and split it before opening the thorax, as Dr. Warthin insisted upon, always with negative results. Dr. Bovaird used this method at the Foundling Hospital for many years and had never seen compression. In the last seven years at the same institution Dr. Howland's experience had been similar. Only the week before, with this point directly in mind, he had dissected the trachea from above in a case of status lymphaticus, but had found no sign of compression. It seemed to be the consensus of opinion that there was almost always lack of evidence of compression at autopsy.

To meet this lack it was claimed that the congestion or edema chiefly responsible for the pressure disappeared after death.

This contention made necessary the employment of clinical proof in opposition.

In the great majority of instances the victims of status lymphaticus died suddenly in a few seconds or in the course of a few hours. Theoretically, it was impossible to conceive that a congested or edematous thymus could exert sufficient pressure to cause death in an individual who up to the very time of his decease had shown no signs of dyspnea. Conclusive was the testimony of those who had seen children die suddenly. Pott, in the course of fifteen years, saw 4 children suffering from status lymphaticus die while he was examining them.

There was cyanosis, convulsive movements and gasping respiration, but he noticed that in every instance the heart had stopped beating when he examined it and that attempts at respiration were continued for a time. Such was not the case with asphyxia. Escherich had had a similar experience.

In children dying with symptoms lasting several hours there was lacking also the great and persistent cyanosis and edema that one would expect from pressure on the great veins.

Such children had dyspnea it was true, but it was a rapid, panting dyspnea and not like that seen with actual obstruction and there was not the great supraclavicular, suprasternal and epigastric retraction that would result if air were prevented from entering the chest. The dyspnea, moreover, came and went with great rapidity and death might occur without any. In the cases that had been operated on for thymus obstruction with recovery, dyspnea had been constant and unremitting. In Siegel's and Rehn's case it had lasted four weeks, in Ehrhardt's case three months and in von Purrucker's case two and one-half years.

Furthermore, almost all those who had observed the clinical course of such cases, and among them were included clinicians of the first rank, denied that the symptoms of tracheal obstruction had been present. It seemed to him, therefore, that, except in a very small percentage of cases, there was lacking anatomical or clinical evidence of death from pressure and that twenty years after the enunciation of Paltauf's views we were still without a satisfactory explanation for death in status lymphaticus.

Dr. James Ewing said that while in Vienna, in 1895, he had seen Kolisko demonstrate several cases of *constitutio lymphatica* at autopsy. In these cases the thymus was persistent or enlarged, the faucial, intestinal and splenic lymphoid follicles were hyperplastic, the aorta was usually small, there were often signs of rachitis, and in the older subjects there was a peculiar feminine type of physical development. These features were very striking and the condition was entirely new to him, not having been described at that time in American medical literature. Yet within a few months after returning from Vienna he had encountered 2 fatal cases, one a young girl who died under ether, and the other a parturient woman who died unexpectedly from trivial hemorrhage.

Status lymphaticus had now become a well-recognized condition of great clinical significance in relation to sudden death. It was frequent enough to be kept constantly in mind, being found in from 1 to 3 per cent. of autopsies. It had been found by Ohlmacher in many cases of epilepsy. Hannseman had emphasized its importance in Graves' disease, and he himself had observed it in 4 of 5 fatal cases of that disease. It figured in most fatalities from short submersion in water, and was the chief underlying condition in fatalities under narcosis. Elser had recently shown that it was present in most cases of fulminant meningitis, an observation verified by Norris and in Germany, so that it must stand as an important predisposing cause of fatal meningitis.

Dr. Warthin's contribution seemed important as furnishing evidence from the proliferation of endothelial cells in the lymph nodes, that there is a toxic element in the condition, and his observation of a case of advanced atrophy of abdominal lymph nodes was distinctly new. The chief point of debate was the etiology of status lymphaticus. Many have thought that in young subjects death must result from sudden compression of the trachea by the large thymus, and he was inclined to believe that in such subjects this might be an important consideration. But compression of the trachea or vagus could not figure in the majority of cases. The disease was not one of young children only, but occurred in adults in whom there could be no question of death by pressure. An interesting point of view was that of Bartel, who held that the condition might have a definite relation to tuberculous intoxication. There was occasionally some histological resemblance of the hyperplastic lymph nodes to tuberculosis. An opinion largely held in France was that the enlarged thymus yielded an excess of internal secretion, with hyperthymization of the system. This theory was open to experimental study. Systematic investigation from these theoretical standpoints was therefore indicated. Careful clinical analysis of the cases was also demanded. Status lymphaticus was not always fatal, but must influence the course of many diseases. Yet one saw in clinical literature little reference to the part played by this constitution in the so-called idiosyncrasies of disease.

Dr. Charles Norris said he had never seen a single example of sudden death in status lymphaticus from compression of the trachea in either the young or in adults. Among adults he had seen many cases of status lymphaticus. It was conceivable that an enlarged thymus, weighing 15 or 16 grams, could compress the trachea, but it was inconceivable that the thymus could increase in size so suddenly through hyperemia; the thymus was *not* a vascular organ, such as was the spleen or the liver. Dr. Norris wished to bring out the point that a clinical diagnosis of status lymphaticus could not be made, but that a diagnosis could be made quite readily at autopsy.

Dr. William P. Northrup, in the matter of narrowing of the trachea without causing symptoms, reminded the audience that a child could breathe through the small caliber of an intubation tube. This seemed incredible in the first days of intubation.

Dr. Northrup also reported the case of a child, eight months old, who had such large tonsils and swollen tongue, so many adenoids, with congestion, etc., that breathing was very difficult; the child could hardly get air down past the base of the tongue and swollen tissues, and breathing was so difficult that it could not sleep. For two nights he could not sleep because of this condition and exhaustion was imminent. Then nasal intubation was thought of. Two smallest-sized drainage tubes were passed down through the nostrils, past the swollen adenoids and tonsils down to the larynx. The child slept seven hours that night. Each drainage tube was large enough to barely admit the smallest probe. An extreme enlargement of the thymus must be present, therefore, to cause sudden death from compression of the trachea.

Dr. S. J. Meltzer doubted that the sudden deaths in status lymphaticus were respiratory deaths. The phenomena of acute asphyxia were so characteristic that nobody could be in doubt as to the nature of the cause of that death, even the laymen present would state simply that "the child suffocated." All the descriptions indicate that we dealt in these cases of death in status lymphaticus with sudden cardiac failure. This, however, could nevertheless have been caused by the sudden increase in size of the enlarged thymus. It was a well-known fact that pressure upon the pneumogastric nerves would cause stoppage of the heart. A normal heart could be arrested many times without any serious consequences. It was different, however, with hearts which had lost their stability from one cause or other. Dr. Meltzer knew from experimental experience that under certain conditions a single slight stimulus applied directly to the vagus would cause suddenly a fatal stoppage of the heart. We might, therefore, assume with reason that in the cases in which the stability of the heart was undermined either by chronic respiratory insufficiency, as in the cases mentioned by Dr. Howland, or by chloroform, or by diphtheria, or by any other infection or intoxication, a sudden enlargement of the thymus might occasionally be capable of exerting upon both vagi within the thoracic aperture a pressure sufficiently strong to bring about a standstill of the heart which would prove fatal. From this point of view we might accept also the theory of Dr. Warthin that in cases of status lymphaticus a good deal of lymphoid material was being absorbed into the system. These substances assist perhaps in robbing the heart of its "factors of safety." Dr. Melzer was very much interested in the view brought forward by Dr. Warthin that the enlargement of the thymus was a compensatory process. Nature tried its hand at healing, but with a disastrous result.

Dr. Charles G. Kerley recalled 3 cases of sudden death occurring in status lymphaticus in which there were no evidences of tracheal obstruction. In one of these cases the child had convulsions, living but a few minutes after he saw it. At postmortem a very large thymus was found. The second case also had convulsions and died suddenly, but there were no evidences whatsoever of tracheal obstruction. In the third case the conditions were similar to those found in Dr. Holt's case. All inhibitory control seemed abolished and the child died of exhaustion due to the tremendous efforts at breathing. In this case there were no evidences of obstruction at all. The postmortem revealed an enlarged thymus.

DR. WARTHIN, closing the discussion, said that he really did not know what was meant by status lymphaticus, unless it was spontaneous death associated with an enlarged thymus and a condition of lymphoid exhaustion. We were in danger of classing too many cases of spontaneous sudden death as cases of lymphatic struma. In England, Dudgeon has given warning concerning medico-legal dangers attached to hasty diagnoses of this condition. We should be very careful of our diagnosis of lymphatic struma, particularly in young children. In his opinion it meant in all cases an enlarged thymus with pressure symptoms. In some cases of sudden death there were no evidences of obstruction, but the operative cases have demonstrated that pressure symptoms may be caused by an enlarged thymus. In some cases, as in the one mentioned by Dr. Holt, there might be an enlarged thymus associated with fever, vomiting and other symptoms. In such cases the enlarged thymus might cause sudden death. In the literature of the cases reported lately, especially in France and Germany, there appeared an increasing amount of evidence favoring the obstruction theory, or the pressure theory, pressure being upon the vagus nerve, the recurrent laryngeal or the trachea. It was, of course, evident that pressure upon nerves might play a part in the cause of sudden death. Intoxications might occur, but a specific intoxication did not cause death in these cases of enlarged thymus. As a result of any intoxications of lymphotoxic nature, there might occur an enlarged thymus and the enlarged thymus be a cause of death, either through pressure or a disturbance of the correlation of the thymic, thyroid and adrenal functions. In the latter case we might speak of a thymic-heart death. In conclusion, there could be no doubt of the existence of thymic tracheostenosis.

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. HENRY HEIMAN. DR. PEASE.
DR. C. D. MARTINETTI. DR. G. R. PISEK.
DR. S. W. THURBER.

DISEASES OF EAR, NOSE AND THROAT.

RICHARDSON, CHARLES W.: VINCENT'S ANGINA. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 91.)

Most authorities show a large majority of reported cases of this disease in children, though in the author's experience it occurs entirely in young male adults. This condition is probably not recognized in many cases, as it is not well known in this country by the general observer. It is due to two associated germs, *i.e.,* a fusiform bacillus (Vincent's) and a spirillum. The bacillus is easily recognized, as there is no other germ growing in the mouth that is quite like it. The spirillum is a true spirochete and cannot be grown on cultures.

Locally, the most annoying symptom is pain, and one is generally consulted for that. The local appearance is described in two forms—the diphtheroid and the ulceromembranous. It is usually unilateral on the upper part of a tonsil and the ulcerous form is by far the more common. The slough is thick and the ulcer deep. The faucial pillars are soon involved and there is cervical adenitis on the side involved. Local symptoms persist for two weeks, but it is liable to run a chronic course.

Smears will give the associated germs. The treatment, after cleansing, is a 5 per cent. solution of silver nitrate.

S. W. THURBER.

ROMAGOSA, M. M.: MASTOIDITIS WITH SUBPERIOSTEAL ABSCESS. (*La Medicina de los Niños,* April, 1909.)

A boy of three years contracted scarlet fever from a brother. The attack was normal. After three weeks pain in one ear appeared, followed by rupture of the tympanum. Suppuration and temporal edema became evident and a diagnosis was made of mastoiditis with subperiosteal abscess. Prognosis bad. An incision on the temple brought forth about 60 grams of pus. The cavity was then carefully curetted, the bone being much corroded.

The antrum was also curetted and drained. Recovery was uneventful. C. D. MARTINETTI.

ALLEN, JOHN HOWARD: OBSTRUCTED NASAL RESPIRATION AND ITS RELATION TO DENTAL DEFORMITIES. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 141.)

The author would emphasize the influence of the enlargement of the adenoid as the main cause of dental deformities, in that it is the prime cause of nasal obstruction. The secondary causes may be loss of occlusion resulting from the parted jaws and the pressure upon the lateral alveolar processes resulting from the tension of the buccal muscles.

The floor of the nose and the median part of the palate arch are composed of the same bony structures, and the biologic law, that any organ which is not used does not properly develop, shows no exception here.

In the normally developing child the distance from the roof to the floor of the nose gradually increases, but in the mouth breather growth in this direction is restricted. The roof of the mouth is thus anchored to a dwarf nose, while the alveolar processes develop freely in a downward direction, but are restricted laterally. The result of these forces is the high arched palate, narrow in front, with insufficient room for the second teeth.

The conclusion the author draws is that, while not all high arched palates are due to adenoids, a very large percentage has this form of obstruction as the chief etiologic factor, and a dentist who fails to take this into account does his patients and himself a serious injustice. S. W. THURBER.

PATHOLOGY.

GARAVINI, G.: CONGENITAL ABSENCE OF RIGHT PECTORAL MUSCLES. (*La Pediatria,* April, 1909.)

This somewhat rare condition was found by Garavini in a boy aged eleven. There were no ill effects from the absence of the right pectoral muscle, which was total. The child was otherwise normal in every way. After reviewing various explanations of this condition Garavini is inclined to suspect the case to be one of progressive muscular atrophy. C. D. MARTINETTI.

SURGERY.

INGALS, E. FLETCHER: BRONCHOSCOPY AND ESOPHOGOSCOPY: THE TECHNIC, UTILITY AND DANGERS. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 94.)

A radiograph should be made, where possible, for many bodies lost in the air passages will cast a shadow. A preliminary tracheotomy should be done in cases of marked dyspnea. If one does not succeed in finding the foreign body after fifteen minutes' search, by introducing the tube through the mouth, the trachea should be opened and the tube introduced there and then, for it is not wise to wait until there is a possibility of infecting the lungs with the tracheal wound secretions, which occur in a day or two.

In children, laryngeal growths may be removed by the direct method more easily than by our older methods. The dangers arise from (1) the anesthetic, either general or local, such as cocain. (2) Local traumatism, even with the greatest care in using the instruments, may be the starting point of a fatal pneumonia, bronchitis, emphysema or edema of the larynx.

Esophogoscopy is of diagnostic value in the examination for strictures, diverticula and malignant growths as well as foreign bodies. The instrument may slip past bodies imbedded in the wall of the esophagus unless careful inspection while introducing it is made.

Two cases, illustrating the difficulties and dangers of bronchoscopy, are cited:—

CASE I. Girl aged three and one-half years. A radiograph showed a small nail in the air passages, though there was no history of having inhaled a foreign body. A surgeon performed a tracheotomy and could feel the nail, but it slipped further down beyond his reach. During twenty-four hours the temperature rose to 104°F. and the pulse 160. On the sixth day a pneumonia was made out on the left side. The nail was shown to be in the bronchus going to the upper lobe by radiograph. Search with the bronchoscope failed to reveal the nail. Three hours later the pulse was 180 and weak and the respirations over 90. The child died in forty-eight hours.

CASE II. Child of seventeen months, with the history of being seized with a severe cough after falling to the floor while playing with an older brother. A radiograph showed no foreign body, but the history and signs made it certain that some substance was in the air passages. Under chloroform, a careful search of the trachea and bronchial tubes was made for one and one-half hours, the condition of the child being very good, but nothing could be found. In six hours the temperature had risen to 105.4°F., pulse 122 and respirations 140. This reaction gradually subsided during ten days, but subsequently there was a four weeks' interval of temperature, dyspnea during the night, and signs showing a slowly resolving pneumonia of the lower lobe of the right lung.

A month later this patient was again examined under chloroform, but with the previous use of morph. sulph., (grain $^1/_{50}$) and atropin sulph. (grain $^1/_{500}$) hypodermically, and the removal immediately after the operation to a croup tent for forty-eight hours. The examination lasted fifteen minutes; nothing was found and there were no bad after effects.

The bad after effects following bronchoscopy are due to the mechanical irritation of the instruments. The respiratory movements over the end of the tube may cause much irritation, the mucous membrane of the air passages not being designed for the passage of foreign bodies as is that of the esophagus. Therefore examination of the latter is attended with much less danger.

S. W. THURBER.

MEDICINE.

SCHAEFFER, K.: AN EPIDEMIC OF GLANDULAR FEVER (PFEIFFER'S DISEASE). (*Jahrb. für Kinderhk.*, May 5, 1909, p. 526.)

Twenty-one cases were observed by the author at the Küsten Hospital, Refsnäs, Denmark, during the course of four months. The disease began acutely with high fever, prostration, swelling and tenderness of the upper cervical glands, especially those behind the posterior border of the upper part of the sternocleidomastoid muscle. Vomiting was occasionally present at the onset. Dyspeptic symptoms were frequently present, and marked constipation was seen in 10 cases. In mild and uncomplicated cases the temperature dropped within two to four days. In some cases renewed swelling of the glands on the same side, or the appearance of swelling on the other side, produced a second rise in the temperature. In 1 case the temperature was normal. Fourteen patients suffered from torticollis. The glands first affected were always those under the mastoid process. In 11 cases the glands of one side only were affected. The swollen glands were freely movable, not matted together, and the skin over them showed no redness except in 2 cases, where the glands subsequently suppurated. In some cases the whole chain of glands along the posterior border of the sternomastoid was swollen, but the greatest swelling was always in the glands immediately below the mastoid process. There was no enlargement of the axillary, inguinal, or mesenteric glands. Coryza was present in 4 cases, epistaxis in 2. In only 5 cases was there redness of the pharynx. This was only slight in degree and never accompanied by exudate. Otitis media on the side of the swollen glands was a complication in 2 cases.

The liver and spleen were not enlarged. The severe cases suffered from anemia, prostration and loss of weight during convalescence.

Streptococci were found in the pus of the 2 suppurative cases. Erysipelas beginning in the neighborhood of the swollen glands was observed in 1 case.

Basing his opinion on the characteristic symptomatology and the bacteriologic findings, the author considers the disease a form of streptococcic infection. HENRY HEIMAN.

NICHOLS, JOHN B.: PARTIAL MYXEDEMA. (*Journal of the American Medical Association,* April 10, 1909, p. 1,162.)

Cases of partial myxedema in children, says Nichols, are nearly all the infantile rather than the congenital form, *i.e.,* they occur at any age in childhood before puberty rather than shortly after birth. The onset often follows some acute infection.

"The figure is short and stunted, stout and obese; the head large; the face large, rounded or circular; the eyes well separated; the expression dull and heavy; the facies old for the age. The skin, especially about the face and hands, may be thickened and infiltrated, dry, scaly and itchy. The hair may be scanty or fall out in patches. The veins may be distended, the surface cyanotic, the hands and feet cold and affected with chilblains in winter, with profuse perspiration in summer. Constipation occurs. The abdomen is often protruding and with an umbilical projection. The tongue may be thickened, the mucous membranes of the respiratory passages turgid, and adenoids frequent, causing obstruction to respiration. Nocturnal incontinence of urine is often noted."

Mentality may be slightly or permanently impaired. Arrest of physical development is a conspicuous feature. Retardation or non-development of the sexual organs is the rule. Treatment consists in the administration of preparations of thyroid gland.

G. R. PISEK.

COZZOLINO, OLIMPIO: CONENITAL HYDROCEPHALUS. (*La Pediatria,* April, 1909.)

The present paper is intended as a complement to others on the same subject by the author. The case was one of marked congenital hydrocephalus in a boy seven and a half months old. No history. Four lumbar punctures yielded in all 265 grams of liquid. Notwithstanding the absence of history of syphilis an antisyphilitic treatment was made to follow. Iodids internally and frictions with mercurial ointment. Patient began to improve directly, and after two years was perfectly normal in every way.

The author is somewhat at loss as to how the exact effect of this treatment took place. C. D. MARTINETTI.

MORAGAS, L. T. CASE OF SCARLATINA AND ITS SEQUELÆ. (*La Medicina de los Niños,* April, 1909.)

The author reports a case of scarlet fever remarkable for the variety of its sequelæ. A boy of five years previously in good health had an ordinary attack of the disease, but at the time of desquamation developed pronounced endocarditis and nephritis. Gradually mitral insufficiency and hypertrophy of the heart followed. These symptoms had hardly subsided under treatment when a violent attack of pertussis set in. The child's condition became rapidly worse and death occurred after five months' illness.

C. D. MARTINETTI.

CHACE, ARTHUR F.: REPORT OF A CASE OF ACROMEGALY. (*The Post-Graduate,* May, 1909, p. 492.)

Chace reports a case of acromegaly in a boy, aged fifteen years, who gave a history of injury to his head when two years old. An immediate convulsion occurred, and six other attacks came during the following year. At thirteen years of age he began to have stiffness in his knees accompanied by pain and loss of weight. Hands and feet were both massive, with the carpal and tarsal bones broadened their entire extent. Tibial and femoral heads were also enlarged. Enlargement of the cranial bones was absent. Treatment by iodids and phosphorus did not retard the progress of the disease. G. R. PISEK.

VALEWZA, P.: CASE OF BARLOW'S DISEASE. (*La Pediatria,* April, 1909.)

Valewza reports a case of infantile scurvy, or Barlow's disease, remarkable for the following reasons:—

(1) The disease commenced at two and a half years of age; later than ordinary.

(2) Improper feeding was absolutely excluded from possible causes.

(3) The disease commenced at a time when the child was exceptionally well.

(4) At first, save for the pain, there were no local symptoms.

(5) There were no alterations of the gums or mucous membrane of the mouth.

The ordinary diet treatment for scurvy gave excellent results.

C. D. MARTINETTI.

ALLARIA, G. B.: AN INTERMITTENT FORM OF TUBERCULOUS MENINGITIS. (*La Pediatria,* May, 1909.)

Tuberculous meningitis usually has a well-defined course and terminates fatally after a period of one to six weeks. Temporary and brief remissions may occur, but seldom have more than a transitory effect. There are, however, some few extremely rare cases in which this disease assumes a chronic and intermittent course, the attacks alternating with comparatively long periods of good health. Allaria cites a case studied by him of a boy aged five with tuberculous history, in whom just such an intermittent attack lasted four months before ending fatally. After the first month the child was able to attend school for several weeks. A postmortem confirmed the diagnosis. The last attack came on abruptly and had no traumatic origin. The author reviews several similar cases that have been from time to time reported. C. D. MARTINETTI.

THERAPEUTICS.

WANDEL, VON PROF. DR. OSKAR: THE QUESTION OF GELATIN THERAPY. (*Die Therapie der Gegenwart,* June, 1909.)

Gelatin, says Wandel, has not disappointed the hope of those who introduced it into general therapy about twelve years ago, as a coagulant in cases of severe internal bleeding. It has often been effective in cases where other hemostatics have been useless. In our own field its most practical use is in hemorrhages as a consequence of hemophilia, purpura hemorrhagica, melena neonatorum, cholemia, and in grave hemorrhages as a consequence of toxemias (septicemia) whose cause and manner of production is not known, and finally in those hemorrhagic states which depend upon a severe grade of chronic anemia and chlorosis. It is of the greatest practical importance to obtain a germ free gelatin without subjecting it to so great a heat that decomposition products will be formed. Even the most costly gelatin contains the tetanus bacilli. The gelatin used is made into a 10 per cent. neutral solution. An Erlenmeyer flask is used to prepare the gelatin.

Sterilization of the gelatin solution is accomplished by placing it (1) for forty minutes in steam at 100°C.; (2) in the incubator for four hours at 37°C.; (3) sterilization again for thirty minutes in steam at 100°C.; (4) repeat the sterilization on the second day for fifteen minutes; (5) empty 40 to 50 c.c. into a glass flask, which can then be sealed. This has been proven to be practically the amount of injection ordinarily required. If the sterilization is undertaken with higher temperature the neutral gelatin is changed into an acid solution. It then loses its coagulability, and there are formed decomposition products, which are the result of fermentative changes of the gelatin. High and long enduring temperatures will cause gluten peptones to appear, which have an opposite physiologic action upon the coagulability of the blood.

As Merck's preparation is free from glue containing cartilage and connective tissue, it is to be preferred in the preparation of medical gelatins. By the use of fractional sterilization high temperatures are avoided, a 10 per cent. gelatin is obtained which coagulates at 27°C., decomposition products are eliminated, and the solution is sterile. It is safer before using the solution to inject a dose of it into an animal, and to make control observations for twenty days. PEASE AND PISEK.

BOOK REVIEWS.

Gout. By Prof. Dr. H. Strauss, Professor of the Third Clinic, Royal Charity Hospital, Berlin. Authorized American Edition. Translated under the direction of Nellis Barnes Foster, M.D., Associate Physician to the New York Hospital; Associate in Biologic Chemistry, College of Physicians and Surgeons, Columbia University. Pp. 70. New York: E. B. Treat & Co., 1909.

In this brief monograph Prof. Strauss deals with the metabolism and the therapy of gout. The factors entering into the formation of uric acid and its appearance in the blood in above normal quantities, the causes of the deposition of sodium biurate in the tissues and the relation of unrecognized nephritis in cases of gout are discussed at length and with clearness. The treatment of the disease is detailed, much attention being paid to the various articles of diet and their extractive content. The medical and the physical aspects of the treatment are sufficiently definite, and for so little space much information is given. The editorial comment is to the point and helpful. It is a little book which will repay careful reading.

Orthopedic Surgery for Practitioners. By Henry Ling Taylor, M.D., Professor of Orthopedic Surgery and Attending Orthopedic Surgeon, New York Postgraduate Medical School and Hospital; Assistant Surgeon, Hospital for the Ruptured and Crippled, New York. Assisted by Charles Ogilvy, M.D., and Fred H. Albee, M.D. With 254 illustrations. Pp. 503. New York and London: D. Appleton and Company, 1900.

The arrangement of Dr. Taylor's book makes it of especial value for the general practitioner. He has grouped under one heading—"General Part"—the congenital affections, the nutritional disorders, the infections, the diseases of unknown origin, tumors, etc., with a discussion of orthopedic examination, diagnosis, and treatment in general. Under another heading—"Special Part"—he deals with the deformities of the head, trunk, upper and lower extremities and their treatment, while the extremely technical part of this subject he has separated under the heading "Technic." In this way one can use the book for reference without having to read about the particularly orthopedic measures unless one wishes, and technical detail is not repeated. A saving in space is thus effected so that the book, while very complete, is not bulky. The text is clear and to the point; the illustrations are many and excellent both in choice and reproduction.

While the orthopedic surgeon will undoubtedly find the book of great value as representing the experience and methods of so eminent an orthopedist as Dr. Taylor, the practising physician especially may here find answer to his queries more easily than in most text-books on the subject.

THE SEXUAL QUESTION: A SCIENTIFIC, PSYCHOLOGIC, HYGIENIC AND SOCIOLOGIC STUDY FOR THE CULTURED CLASSES. By AUGUST FOREL, M.D., PH.D., LL.D., formerly Professor of Psychiatry at, and Director of, the Insane Asylum in Zurich (Switzerland). English adaptation by C. F. MARSHALL, M.D., F.R.C.S., late Assistant Surgeon to the Hospital for Diseases of the Skin, London. Illustrated. Pp. 536. New York: The Rebman Company, 1908.

This is a large, exhaustive and carefully written book on an important subject. The author maintains throughout his scientific spirit and approaches his subject with candor and yet with delicacy. He evinces his desire for an improvement of existing sexual conditions, and the book is not only an exposition of sexuality, but a plea for a cleaner and more spiritual sexual life. Being content with stating truths about sexual matters abstractly and adducing few concrete examples, there is practically nothing in the book which might not with safety be read by young people of either sex, provided that it be thought advisable for young people to know both normal and abnormal aspects of the sexual question. The chapters on the biologic facts of the subject are written with admirable clearness; the psychologic and sociologic questions are treated with sufficient fullness and considerable vigor. Seldom, if ever, have we seen this question treated elsewhere from so lofty a point of view, or a book with a similar title in which there was nothing avoided and nothing salacious introduced.

ARCHIVES OF PEDIATRICS

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ORIGINAL COMMUNICATIONS.

A FEW OF THE THINGS A PEDIATRICIAN SHOULD TEACH.*

BY P. J. EATON, M.D.,
Pittsburg.

In developing the subject I have chosen, I shall not try to tell you anything which you do not already know, nor shall I attempt to bring forth any new or startling facts. Yet some of the things I may say are so simple that possibly they have been passed over in your teaching.

I have been so deeply impressed by the utter lack of real knowledge in regard to infant life as seen in the work of many general practitioners, and in the conduct of families by the parents and nurses, that I have, in my own practice, in my lectures to nurses, and in my teachings, tried to bring home to those who should be interested some common-sense facts, and some principles which one could almost dignify as axioms.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 27, 1909.

When we consider that nearly all children come into the world strong and healthy, when we remember what a large proportion die before their third year, and when each of us recognizes the fact that lack of knowledge on the part of those who should know is responsible for much of this great loss of life, the necessity for the simple common-sense teaching of parents and nurses, and of the growing generation of young women too, becomes apparent.

Very few people, be they fathers, mothers, nurses or doctors, think of their responsibility to the child, and through it, to the state; or, if they do realize their accountability, many deliberately neglect their opportunities for the betterment of the race.

Strong, healthy men and women, with alert minds in physically competent bodies, both governed by a steadfast moral character, are what is wanted by this nation, else decadence will begin. Our sociologic instincts have of late years been stimulated, and much is being done to ameliorate the deplorable conditions which surround the average citizen, but I most emphatically declare that the physical, mental, and, of necessity, moral training, should begin with the birth of the child, and I further believe that no body of men are so competent to teach the true principles of right living, as those who love and are interested in little children.

Now, how shall we, who recognize our responsibility to the young of our race, best teach and practise that we may obtain better results; results which shall leave an impress for the general betterment; results which shall be object lessons for those who see, and, seeing, be led to imitate?

Among other things, we should teach that babies have certain rights—the right to live, the right to be comfortable, the right to grow to manhood and womanhood in the image of God and not of the devil.

I believe that to live, to be comfortable, to grow, are dependent on the right following of fundamental rules which should be in force, and enforced from birth. First, we must teach regularity, the cultivation of accurate habits in the baby; make a machine of the little one. Teach it to employ its various functions at fixed and convenient times.

Should we teach that a child should be fed at precise intervals, and that it can be trained to digest? It is a fact and not a theory that gastric juice is not present all the time in the stomach in quantities sufficient, and it is also a fact that when a stomach is led to expect food at given intervals there *will* be gastric juice there, or ready to be put there; whereas, when food is ingested when the stomach is not so supplied, the food must remain in the organ—warm, moist, already with ferments in it, being rolled about and generating unwanted and unwonted chemical products; *or* the stomach is called upon to manufacture gastric juice in a hurry, and perhaps when, only a comparatively short time before, it had done its true work.

Has any one the right to ask the delicate economy to undergo any of these conditions? Why is it necessary to emphasize this? Because most mothers think that if the *intervals* between feedings are correct, the scheme of regularity is being carried out. Far from it.

Shall the child be awakened for its food? Nay, say all the grandmothers. Yea, says the scientific medical man, and for the reasons already enumerated. And yet, if the scheme of absolute regularity be carried out, such a "creature of habit" does the stomach become that the child will, as a rule, at the prompting of its inward monitor, wake for its feeding at the right time. Experience teaches that, in prescribing the interval of feeding in any given case, the actual hours for feeding must be *written out*. and the mother be impressed with the fact that ten o'clock means ten—not 9:30 or 10:15 and so on. Plainly put, these facts can be readily understood by the average parent or nurse.

It is very easy to teach a very young baby what is expected of it in the way of regular defecation and often the feel of the "potty" underneath its buttocks, and the upright position, will give it all the hint necessary, and the results follow—an economy in washing and a mighty good habit. The bath should come at a fixed hour, too, followed by a meal and a nap. Simple points all, but worth teaching nurses and mothers.

Can children be taught to sleep? Most assuredly. When the sequence of the daily routine has brought around the sleep hour, *prepare* the child today as yesterday—put it in its bed, darken the room and leave it *alone*. We used to be told that "the hand that rocks the cradle rules the world." The modern and correct version is that "the hand that rocks the cradle spoils the world."

Rocking, patting, singing, all are pernicious habits. The trained habit of sleep becomes soon almost automatic and the usual house sounds are unnoticed.

I said that the child has a right to live, but living means proper food as well as proper feeding intervals and proper sleep. We can all assume and teach as an axiom that the Lord knew best when He made breast milk for babies, and it as truly follows that if we do not in individual cases have breast milk in sufficient quality and quantity we must give that which most nearly approaches breast milk physically and chemically.

Man is ingenious, but with all his ingenuity he has not yet made an artificial food which can equal normal breast milk as a food for growing infants. The wisdom of Solomon is no longer abroad in the land, and he who says any one patent food is the *only* substitute or is a *genuine* substitute for breast milk, is nearer the class of the Ananiases than that of the Solomons. No one yet has devised a food nearer, physically and chemically, to breast milk than is modified cow's milk. Raw, sterile, with its relations of fat, proteid and sugar correct for the given infant, it will do next best to normal breast milk. Teach the mothers and nurses what good milk is and where it can be obtained.

Direct your mothers to fasten securely the pages of their nursery guide which are devoted to the feeding of babies. Those alluring tables are the result of the good work of an eminent man over many years, and are, as it were, a composite photograph of all the food formulæ as applied to babies *en bloc,* but you and I do not have *average* or composite types of babies brought to us. Each one is an entity, different in one or many characteristics from each other child. I beg you to teach that it must be fed as a unit, giving it that which suits its individual needs, regardless of weight, age or other conditions as put forth in the feeding tables. To do it is to succeed in a very large number of cases. Teach the mothers that the living skillful medical man is superior to the printed book.

In its pursuit of happiness and comfort the child should be suitably clothed, and I submit that while our modern way of dressing babies has much in it that is artistic and lovely so far as *looks* go, it is conceived on a wrong basis. Did you ever observe that the baby is turned or rolled over from six to twelve times while its clothes are being put on or taken off, that it is held up by the heels while its trousers are shaped upon it, and that it is pried up by the back of the neck to finally button its slip? Why should its clothes not all button up the back or all button up the front? The less the baby is handled the better for it. To open the minds of the young, growing generation of girls to this fact means, in time, sensible clothes for infants.

We clothe babies that we may conserve the body heat and make less deadly in their effects the great changes of temperature which obtain in our inhospitable climate. We want next the baby's skin a protecting layer, if you will. I believe this end can best be obtained by clothing the child, as to its underclothes, in linen mesh, which in these days can be obtained in sizes becoming to all ages. Then, having this layer of constant protection next the skin, put on outside garments according to the thermometer and the wind. Most people dress their children as the street railway heats its cars—*i.e.*, by the calendar and not by the thermometer. I have seen children brought to my office in December when the temperature outside was 50°F., clothed as for an arctic expedition, and sweating like a running Malay. What an elegant set of conditions for the inception of a bronchopneumonia!

Naturally enough comes next the consideration of the amount of fresh air the child should have, and its relation to the health of the child.

The growing child needs lots of oxygen for its proper tissue metabolism, and it can best obtain it if kept in the open air most of the time. It does not harm babies to be in cold air if properly protected, but to be shut up secure from fresh air causes much deterioration in their condition. The child, after its first few days, should be in the open air daily (weather permitting) for as long as can be arranged for, and it should always sleep at night in a room in which is free, flowing, out-of-doors air in abundance. An earnest word now and again will aid in convincing people that most of the illnesses, even pneumonia, can best be treated in the open air.

As the child grows, the question of diet becomes a very live one, and many a child is ruined because of the anxiety of parents, or more often of grandparents and other relatives, that it should eat solid food. An exceedingly good rule to follow is, "Things which need chewing must have used upon them teeth capable of grinding." And, because digestion begins in the mouth, almost all solids must needs be masticated thoroughly that the necessary physiologic processes may go on in the proper way. As the child grows add to the diet those things which common sense will indicate—simple, easily-digested articles—junket, custards, well cooked cereals, broths, meat juices, stewed or raw fruit (put through a sieve) and so on.

The question concerning the effect of dentition upon the general and special conditions of the child is a live one, and what little teaching there is is apt to be erroneous.

Some there be who consider that it is a crime to put lancet to the gums, no matter how much pain the child may be suffering, or how much upset it may be.

Teething is a physiologic process, they argue, and should be let alone; and further it is held that there are no symptoms directly referable to dentition. Let us teach that teething is certainly a physiologic process when *normal;* and, if normal, no interference is necessary; but when the gums are very tough, when the teeth are forced along rapidly, the discomfort and pain are great. It is easy to prove that the irritation of the mucous membrane by the pressing teeth causes a change in the reaction of the saliva, and prevents normal digestion. A piece of test paper will often show an acid reaction of the saliva instead of the normal alkaline reaction, and one often sees a complete relief of gastric symptoms after the offending tooth has been freed. Imagine, if you please, the effect on the delicate nervous system of a growing child of the simultaneous pressure of four rapidly pushing anterior molars. I have pried open the mouth of a child in convulsions, cut the inflamed gums over several teeth, and with no other treatment have seen the spasms cease—not to return again. As a sweetener of the child's disposition, there is, at times, no remedy the equal of the gum lancet—anorexia, peevishness, temperature, sometimes accompany the painful attempt to erupt teeth, due, I admit, only *indirectly* to the teeth as anatomic entities, but, nevertheless, symptoms to which attention must be paid. All of you who have studied children to any extent have undoubtedly seen cases where the only sign of dentition was a coryza. Further examination will often show an irritated mucous membrane over certain teeth, and the relief of this irritation by freeing the teeth is always followed by the disappearance of the so-called "cold."

Defecation is a physiologic process, yet who would contend that laxatives or cathartics or enemas were never to be advised? That one should wait till nature or the physiologic processes had done their work?

The man who would so argue would be lacking in common reasoning power. Common sense, the hard thinking, dispassionate kind, which reaches reasonable conclusions as to the matter in hand, is what counts most in the treatment of little ones.

Some years ago I had occasion to make some remarks at the Academy of Medicine on the conditions met with in the prepuce of boy babies, and something as to the care of this part of the body. In looking up the literature, I was amazed to find how little attention had been paid to the subject by most authors, four lines by Dr. Rotch being the maximum of discussion. I believe that we should teach, as my old professor of surgery taught, that the toilet of that part of a boy's body was as important as that of his eyes, ears, or nose, and that if the natural or customary adhesions between glans and prepuce do not disappear in the early weeks, the preputial orifice should be dilated if necessary, the adhesions broken down, and a simple dressing with sterile vaselin applied. Then the attendant should be instructed to thoroughly cleanse the area in question daily and apply the ointment till the membrane has thoroughly healed. And that thereafter the parts should be cleansed daily. I believe that there is less likelihood of the formation of bad habits later if the mucous membranes are accustomed to ordinary stimuli. I also teach that the corresponding parts in the female infant shall have equally good care, for I have seen many instances where later in life the preputial irritation in girls has been a source of much trouble and inconvenience. These are a few of the things that we, who love children, should teach, and many are the opportunities which fall to us in our practical work among our colleagues, as well as among the parents and nurses.

In the June, 1906, number of the *Outing Magazine* is an article by Copley, which I commend to the attention of each one of you. Its title is, "Give the Baby a Chance," and while it gave me much personal encouragement and comfort, it has served to enlighten the minds of many mothers and grandmothers to whose attention it has been called, and to ameliorate the life conditions of many children who were suffering from too much, or too little, so-called *care*.

DISCUSSION.

Dr. Morse.—I have expressed my opinions on the subject of interference with the genital organs of children so many times that I am afraid that if I do not do it again it will be assumed that I have changed my mind. I object to circumcision, and even to the retraction of the foreskin, now as I have always. It is a normal condition for the prepuce to be adherent in small babies and to remain adherent for a good many years. These adhesions very seldom cause any disturbance. When they do it is time to interfere, not before. The habit of masturbation is, I believe, not confined to Christians. It seems to me that this interference with the genital organs of small children is, to a large extent, the manifestation of a morbid interest of one sex in the genital organs of the other. It is, in my opinion, far more often suggested by nurses than by physicians. In many cases it has seemed to me that the only reason for interference was the chance of an operation with the consequent fee. Interference is, in my opinion, in most cases unjustifiable.

Dr. Eaton.—In reply to Dr. Morse, I would say that while I thoroughly agree with him in his contention that the prepuce is ordinarily adherent, I do believe that many cases of disturbances are caused by a large collection of smegma beneath the prepuce, and that such cases ought to be operated on at once. A circumcision is almost never required, but simply the breaking up of the adhesions and the cleansing of the glans is sufficient. It has not been my experience that it has been suggested by nurses, but has been called to my attention by the behavior of the babies in a large number of cases.

This week I performed this simple operation on a baby and removed from beneath a distended prepuce a very large amount of smegma. This was causing much pressure, and the child's attention was constantly attracted to its genitals. I do not at all wish to be understood as advocating interference in every case, but do believe many cases need this attention which do not receive it.

A Plea for the Use of Antidiphtheria Serum in the Laryngitis of Measles.—A. A. Warden (*The Lancet*, May 15, 1908) believes that in the laryngitis of measles we should not wait for the result of a bacteriologic diagnosis, but inject serum immediately. Laryngitis is a frequent complication of measles and is occasionally membranous in character, while nondiphtheritic membranous laryngitis is rare. We should inject the serum as early as possible when once laryngeal symptoms are noted. One case illustrative of the advisability of the author's plan is described.—*New York Medical Journal.*

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SOME OBSERVATIONS CONCERNING SCARLET FEVER, RUBELLA SCARLATINOSA, AND SO-CALLED DUKES'S DISEASE.*

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Because of the hackneyed character of my theme, this paper is presented with considerable hesitation. No new facts are adduced that will clear up the confusion still existing in the minds of many practitioners concerning the affections I am about to consider, these observations being recorded solely for the purpose of bringing forward several points connected with the symptoms, diagnosis and identity of scarlet fever and rubella, which have often interested and puzzled me, and doubtless may have interested and puzzled some of those present to-day. I hope I may be pardoned if I introduce my subject by briefly relating some case histories, which, for the purpose of study, have been divided into groups.

GROUP I.

Many years ago I saw a girl of thirteen, who was taken abruptly ill with sore throat and a scarlatinal rash. The throat was bright red, and the tonsils the seat of a yellow exudate. The lingual papillæ (fungiform) were rather prominent, and the tongue coated. The temperature was 102.5°F.; the pulse, 120. The eruption had begun on the chest, ears and upper arms; was composed of minute red dots, or puncta, surrounded by areolæ of lighter hue, and was marvellously like that of scarlet fever. It spread rapidly over the body, but appeared only sparsely below the knees and on the forearms and backs of the hands as discrete red dots or points, very slightly elevated, with areas of normal skin intervening. It was attended with considerable itching, and lasted five days, and was followed by a furfuraceous desquamation, but there was no peeling. On the second day the temperature was 99.5°F. and 101°F. respectively, gradually falling to normal with the disappearance of the eruption. The tongue cleaned off, but did not leave the papillæ particularly enlarged. There was no initial vomiting, and the child at no time appeared ill. As the patient had never had scarlet fever, I regarded the case as such and acted accordingly. Exactly fourteen days after the initial symptoms of the preceding case, her sister, aged fifteen, who had had scarlet fever severely many years before, and who had not been near the first case since the first hours of the attack, was seized with a precisely similar disorder, viz., exudative tonsillitis, fever (102°F.), scarlatinoid rash (more extensive than her sister's), moderate course, and no desquamation. The day following the development of the second case, a third sister, aged nineteen, who also had not had scarlet fever, became ill with a well-marked exudative tonsillitis, fever (103°F.), no lingual change, absolutely no eruption, and no desquamation. In all the cases the urine was normal. The occurrence of the second case in one who previously had been the subject of scarlet fever caused the diagnosis to be changed to rubella scarlatiniforme, although that exanthem was not present at the time. I was perplexed, however, that in a small house-epidemic of what was apparently *not* scarlet fever, 2 cases should occur with eruption and angina, while a third had the angina alone—an association of phenomena not uncommon in true scarlet fever. The only remaining explanation, viz., that the cases were simply tonsillitis with fortuitous eruption does not seem worthy of consideration. No mention of the condition of the cervical glands is made, because this feature was not noted.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 28, 1909.

GROUP II.

In the summer of 1895 I observed an attack of eruptive disease in a child of ten, which was the exact counterpart of those just described. This patient, who had never had scarlet fever, nor has had it since, after twelve hours of sore throat, had a densely punctated scarlatinoid efflorescence on the chest, trunk and back. Over the surface of hands and feet the puncta were discrete, consisting of minute, slightly elevated red dots; the body otherwise being well covered. The eruption lasted five days, and disappeared without desquamation. At the onset the temperature was 103°F., the pulse 140, but neither rose during the next and succeeding days above 100° and 99°F. respectively. On both tonsils were patches of yellow exudate. The tongue was very red, but the lingual papillæ were not especially elevated, nor did it desquamate in any peculiar manner. All the cervical glands, anterior and posterior, were palpable. Initial vomiting was absent. The urine was normal, and the child at no time appeared to be ill. I was, at first, in doubt as to the nature of this case, but the appearance of a similar attack, pronounced scarlet fever by two physicians, in a boy in the same hotel, with whom my patient had played just prior to her illness, led me to isolate the child for four weeks; but desquamation never supervened, although the boy was said to have peeled profusely. Still, as far as my case is concerned, I was never satisfied with the diagnosis of scarlet fever; an uncertainty in a measure confirmed by the discovery that there had been in the neighborhood during the previous spring an extensive epidemic of a mild eruptive disease, which had only in few instances desquamated, and which physicians had variously denominated rose-rash, roseola, scarlet fever, etc. (This case, from the rash, throat, and general symptoms alone could not be separated from mild scarlet fever. It was the absence of desquamation of skin and tongue, and the occurrence of the aforesaid epidemic that made the diagnosis of rubella probable.)

GROUP III.

In the fall of 1899, H. H., aged eleven, who had had scarlet fever some years before, was taken ill with sore throat, vomiting and fever, and in sixteen hours, with a dull red, scarlatinoid, punctated rash, commencing upon the chest and covering the whole body densely, except on the hands and feet, where it appeared as small, closely set, but discrete red dots. On the tonsils was a dirty-yellow exudate, and the papillæ of the tongue were elevated. The cervical glands were palpable, and the constitutional symptoms marked; the temperature, 101° to 103.5° F.; the pulse, 120 to 140. The eruption lasted five days; but although closely watched for five weeks, no decided desquamation of the tongue, and none whatever of the skin, was observed. At the height of the illness the urine contained albumin and a few hyalin and granular casts (febrile albuminuria), but not subsequently. In the second week there was synovitis of both wrist-joints, and during convalescence otitis media and mastoid disease requiring operation. Certainly one would feel justified in calling this case scarlet fever, yet the previous attack of this disease, the total absence of desquamation with a *most pronounced eruption,* and the fact that the patient was subject to severe tonsillitis, caused me to look upon the attack as one of sepsis, although rubella scarlatinosa or fourth disease, if there be such, cannot be ruled out. (In Curtis's and Shaw's epidemic of scarlatiniform rubella, *Medical News,* December 20, 1902, there were many cases as pronounced, and with complications as severe, as in this one.)

GROUP IV.

None of the children in this group had suffered from, or had been exposed recently to, scarlet fever or rubella. On September 4, 1908, E. T., five years old, awoke with sore throat and some malaise. At noon he had fever and a rash, which at 3 P.M. was discovered to be a punctate scarlatinoid erythema on the chest, back, trunk and arms. There was an exudate on both tonsils, a stippled palate, not very red; no marked engorgement of the lingual papillæ, a temperature of 102.5°F., and a pulse of 150. That evening the temperature was 103°F., and the next day 101°F., with a pulse of 100. On the following and succeeding days the rash spread to the forearms, legs, hands and feet, where it was sparse and inclined to be discrete, as is so frequently observed in scarlet fever. The eruption lasted four days and was attended by considerable itching. The face remained free. The glands posterior to the sternomastoid muscle and back of the ear were palpable. A consultant saw this patient on the third day, and scouted the idea of scarlet fever, regarding the rash as accidental. With considerable reluctance on my part, desquamation not supervening, quarantine was raised on the eighth day; and that night, for some unaccountable reason, the patient's sister, aged three, occupied the same bed with him. In exactly seven days the latter developed a similar train of symptoms, except that there was initial vomiting, *twice repeated,* a more pronounced rash coming out in twelve hours and involving the face, with circumoral pallor and pin-head elevations, generally at the site of the hair follicles ("goose-flesh" appearance); a tongue with enlarged papillæ, desquamating on the third day; enlarged postmastoid and anterior cervical glands, and a temperature, which, although not higher, persisted longer. Simultaneously with the onset of the sister's illness, the baby, eighteen months old, had slight tonsillitis and a temperature of 100°F., a faint scarlatinoid rash on chest and trunk, enlargement of postcervical glands, and no desquamation. At the same time the grandmother, who had had scarlet fever many years before, and who nursed the baby, also developed tonsillitis without eruption. The boy desquamated in branny scales in the groin only; the girl not at all on the trunk, but on the seventeenth day there was slight peeling from some of the fingers and toes and the palms of the hands.* The urine in all remained normal, except that in the girl a trace of albumin and hyalin and granular casts were found at the onset only (febrile albuminuria). These cases were pronounced scarlet fever, largely because of the desquamating tongue in one, and the short incubation of the second and third cases, viz., seven days from the release of the boy from quarantine, although infection might have occurred *fourteen days earlier,* when the first case developed. Rubella, however, cannot be positively excluded; the postauricular glands were enlarged, and remained so for quite a time, and desquamation, notwithstanding a pronounced rash, was practically wanting.

Although I have designated the probable diagnosis in each of these groups, I do not feel quite positive as to any of them. If all the cases had occurred in one epidemic, there would be little difficulty in asserting, with the exception, perhaps, of Groups I. and III., that they were, at least, not scarlet fever; but happening individually or in small house-epidemics, the proposition is different. That Groups I. and IV. were simply tonsillitis with a scarlatinal erythema is not conceivable; they were clearly instances of one of the infectious exanthemata.

This brings up several points in connection with these affections which I desire briefly to discuss: First, Can scarlatina occur with a pronounced eruption, but without subsequent desquamation? Exfoliation of the epidermis is a feature of this exanthem generally considered as characteristic as the efflorescence; but T. S. Westcott and C. G. Kerley have seen cases without it, and McCollom says not all cases desquamate; consequently, too much stress must not be laid upon *this feature.* Its presence is of less moment than its absence, the latter being of considerable diagnostic value in excluding scarlet fever. The peculiar feature of scarlatinal scaling is its long duration and often late appearance. This point is of material importance, and helped to throw the balance in favor of scarlet fever in my last group. Schamberg believes that in the majority, if not all, of the cases of scarlatina, vesicles are present, and that desquamation is directly proportionate to the amount of vesiculation. Trousseau has made the same observation. If this be true, it is not difficult to conceive of cases in which the corium is less deeply affected, hence no vesication and consequent desquamation. On the whole, the evidence seems to confirm the possibility, but infrequency, of a well-marked rash in scarlet fever without desquamation.

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* Daily inunctions and baths were used in these cases.

Second, Can there be angina in rubella scarlatinosa with no efflorescence upon the skin—a rubella *sine eruptione?* We know that this is observed quite frequently in scarlet fever, but I am acquainted with no observations as to such an occurrence in rubella; yet in my first group, the cases of which were certainly not scarlet fever, and in my fourth, which might have been rubella, this event happened; and as in rubella scarlatinosa an exudative tonsillitis, often quite as severe as in scarlet fever,* may occur, there is no inherent difficulty in believing that in rubella, as in scarlet fever, there may be an angina without eruption as the only manifestation of the disease. If this is impossible, then my first cases were either scarlet fever or tonsillitis—an assumption I am not willing to admit.

Third, Is the strawberry-tongue (*i.e.,* the desquamating tongue with enlarged papillæ) always observed in scarlet fever? Griffith says that he never saw a case without it; Kerley, that it may or may not be present, and is of little value in diagnosis; McCollom, that it is a constant symptom, never absent, though, if slight, it may escape detection; Holt, that although frequently seen, it is not peculiar to the disease. Many of the older writers regard this as the most constant feature of scarlet fever, and pathognomonic in itself; but, without doubt, it is sometimes absent in genuine cases of scarlet fever, and is seen in other conditions;† and, as these conditions may exist in scarlet fever, its mere presence in a scarlatinoid affection is no evidence of scarlet fever. Its presence, however, is of very strong confirmatory proof, more important than its absence, and is of material assistance in the differentiation of these disorders.

In the case which I have cited the question of the ordinary, or morbiliform, type of rubella never arose; nor was the erythema infectiosum of Escherich considered; the diagnosis lay wholly between scarlet fever, rubella scarlatinosa and some other affection—the so-called "fourth disease" of Filatow and Dukes. Were my cases, after all, but instances of this possible new exanthem? With the exception of the conspicuous absence of desquamation in most of them, they conformed, barring some minor details, to the description of Dukes and others (Weaver, Simpson, etc.), but they also correspond to varieties of rubella often observed when this disease is epidemic in a scarlatinoid form, as well as to many mild cases of scarlatina. It must be confessed that it is unusual for one affection to exhibit two such distinct types as the two varieties of rubella, the one very much like measles, the other closely resembling scarlet fever. No such distinct types are found in the other eruptive diseases, yet the occurrence of epidemics in which one type alone is seen, or of epidemics of one or the other type in which the opposite type is observed, seems to show that such wide variations in one disease are not only possible, but do occur.

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* See Curtis's and Shaw's account of the epidemic of rubella scarlatinosa at Round Lake, N. Y. (*Medical News,* December 20, 1902.)

† In epithelial desquamation of the tongue—so-called geographical tongue.

Although it would be interesting, it is not necessary to enter into a critical analysis of Dukes's claims. This has already been done in so masterly a manner by Griffith and Ker that I think the latter's verdict of "not proven" must, for the present, at least, be accepted. Until it can be shown that an attack of "fourth disease" protects against rubella, and yet occurs in those who previously or subsequently have had scarlet fever, the existence of a distinct and new exanthem must be denied. As yet, no such evidence has been forthcoming, and I am fully in accord with Griffith that the recognition of a new exanthem would be little short of a calamity, and would but tend to make "confusion worse confounded." With our present knowledge, it is safer to regard these specific scarlatinoid exanthems as mild scarlet fever, as many of them undoubtedly are, or as rubella scarlatinosa, as some of them also are, at the same time keeping our minds free to the possibility of a new disease, or to the old doctrine of the hybrid nature of German measles, having in mind Goodhart's contention that there is no inherent objection to such a conception: "Plants and animals vary their type under domestication; why may not disease germs be subject to similar variations? There is really no essential difficulty in regarding rubella as a hybrid, and none in regarding it as a distinct, but, as yet, unstable species."

Diagnosis.—In the differentiation of rubella scarlatinosa from scarlet fever, an observation made by the writer some years ago has appeared, at times, to be of value. I refer to a prolonged prodromal period in rötheln. This, in my experience, exists more frequently than is generally supposed. I have often observed distinct, but slight, prodromes of two or three—exceptionally five—days' duration, consisting of malaise, mild catarrhal symptoms, or enlargement of the postmastoid glands. T. S. Westcott informs me that he, also, has found this feature of some value in diagnosis. (This may exist as the only prodromal symptom for several days before the appearance of the eruption.) The fact that the eruption of scarlatina, as a rule, avoids the face, while the converse obtains in rubella, is of no value in diagnosis, for in some epidemics of rubella scarlatinosa, as in scarlet fever, the face is apt to remain free. The question of the possibility of second attacks of scarlet fever inevitably arises in a discussion of this character. Scarlet fever was ruled out in the first, and, especially, in the third group of cases, because of the history of a previous attack. Second attacks undoubtedly occur, but it is significant that they were more frequent when the identity of the various scarlatiniform erythemata, as well as that of rubella scarlatinosa, was not as completely understood as it is now. Only cases supported by the strongest evidence should be accepted as genuine. So difficult and often impossible is it to distinguish between rubella scarlatinosa and scarlet fever, and mistakes may have such grave consequences, that it behooves us to be very slow in making a diagnosis of rubella. Students and others should be taught that German measles is a rare disease, scarlet fever a common one, and that the custom of calling every mild scarlatinal eruption roseola, German measles, etc., is a bad one, and is fruitful in disseminating the more serious affection. This is the opinion of all who have had opportunity of seeing large numbers of cases of the infectious exanthemata. Too much stress cannot be laid upon the fact that scarlet fever may occur with the mildest constitutional symptoms. Williams (*British Medical Journal,* No. 2,138, 1901) has reported an epidemic of scarlet fever resembling rubella scarlatinosa in which there was no vomiting, a low pulse-rate, no lingual desquamation, and no renal complications. Many of these cases were treated in scarlet fever wards, but none contracted scarlet fever. My own mishaps have taught me that in cases of doubt one should act as if the more serious disease were present; and when we meet with cases which, in the absence of an epidemic, we cannot explain satisfactorily, to treat them as scarlet fever until they do or do not desquamate, even if considerable inconvenience and unfavorable criticism are evolved thereby. The public and the physician, as well as the patient, should have the benefit of the doubt. Rubella scarlatinosa should be admitted only on the strongest evidence, and lack of well-marked signs, or of any of the usual signs of scarlet fever, as all of us know, is not sufficient to exclude this exanthem.

Finally, I would call attention to the mildness of the scarlet fever prevailing at the present day, and to the well-known fact that there have been periods in its history in which it was considered a very trivial affection (Sydenham), just as rötheln is now, and that, on this account, its contagiousness was at one time actually denied (Chapman, 1833-36). Is it possible that we are passing through or entering upon a similar epoch in the history of the disease, and that this explains many cases of rubella scarlatinosa and the question as to the possibility of a "fourth disease"?

DISCUSSION.

DR. KOPLIK.—As to the question of second attacks of scarlet fever, I recently had to look up this matter and gained the impression from the literature that such attacks are quite possible, though rare.

As to scarlet fever, there are recorded cases of a very mild nature, and recently in New York there occurred a number of cases that were very mild in character which closely resembled röthlen. The temperature rarely ran above 100° F. or 100.5° F. A mild rash appeared, but left nothing behind. The patients continued comparatively well until the tenth day, when the cervical glands enlarged and the child became quite ill, running high temperatures, and this continued for a week or more. In one case the patient had an evanescent rash, and on the tenth day developed enlarged glands, and a week later went into a condition of convulsions with suppression of urine. I came to the conclusion that these cases were cases of mild scarlet. Though the rash was very mild the subsequent course was not so mild. I agree with Dr. Miller, that in practice we should assume that a case is scarlet, no matter how mild the eruption, until we have proven otherwise by isolation and watching for several weeks. In the cases I mention, quite a number were in my own practice, and they developed a fine branny desquamation sometimes three weeks after the eruption.

As to the postcervical glands in röthlen, I have seen and described them. A patient once asked me why the glands in the back of her neck were enlarged five or six days before the development of this disease.

DR. SHAW.—In regard to the epidemic quoted by the writer, Dr. Curtis, who saw the cases with me, is a man who has had as much experience perhaps as any one in the state of New York outside of New York City. There was not a shadow of doubt in our minds that we were dealing with an epidemic of rubella scarlatinosa. This little village of Round Lake is a summer resort, with, in winter, about four or five hundred population. To have been quarantined would have worked a hardship upon these people. A peculiar feature was the endemic character. A large majority, over 40 per cent. of the population, contracted this eruptive disease. It was more prevalent among adults than among the children. The rash was typical and in two or three weeks there was desquamation. The incubation period was twenty-one days. The local doctor had treated quite a number of children and adults for scarlet fever in previous years. Over 20 of these people had had scarlet fever to his knowledge. The condition of the entire lymphatic system was striking. The postcervical glands were enlarged in every case, and persisted for six or eight weeks.

I was recently called in to see a boy of fifteen with a very acute rash and found that he had had four other attacks since going to school. Each time he has been quarantined and kept out of school.

DR. ADAMS.—I would like to ask how many have seen, or actually attended, cases of scarlet fever in the second attack? Of course, it is possible for an individual to have a second attack, but my experience has been that when I made a diagnosis of scarlet fever the mother has told me that the child has had the disease before, but after the disease was well developed then she would say, Well, the last time it was not like this. I once asked an old practitioner, who had been practising in Sheppardstown, Va., for over fifty years, if he had ever attended a case of scarlet fever the second time, and he said no, but that he had attended cases that had said that they had had scarlet fever before. Very frequently we have cases in which the history would seem to be that the child has had scarlet fever and it would be interesting to me to know of authentic cases of second attacks. I have attended people for over thirty years and have not seen a second attack in the same individual. We cannot place any reliance in statements of the family. They may make the statements to protect themselves from quarantine.

DR. FREEMAN.—It seems to me in a questionable diagnosis between scarlet fever and German measles it is important that the cases be treated as if they were scarlet fever. We had at the Foundling Hospital a few years ago an epidemic of some 8 or 10 cases occurring at the same time, none of which had a temperature over 101.5°F., and with slight rash, and yet almost all of them had bad complications, nephritis, bad joints and suppuration of the glands of the neck.

DR. ROTCH.—I have never seen a recurrent scarlet fever in my own practice. I should say it is quite rare.

DR. ABT.—I have diagnosed scarlet fever twice in the same individual. Six or seven months ago I saw a little boy with one of these nondescript rashes and felt called upon to call it scarlet fever. About five months later he came down with a distinct scarlatina and finally desquamated. Previously there was some doubt as to whether he had desquamated or not. We are not always in a position to make a definite diagnosis, and I am in accord with Dr. Miller that these doubtful cases which closely resemble scarlet fever should be regarded as cases of scarlet.

I should like to ask Dr. Shaw if in the epidemic he refers to there could have been any relation between it and the milk supply. In a suburb of Chicago quite a distinct epidemic was traced to one of the milk supplies, where several of the employees were actually desquamating.

DR. SHAW.—The question of the milk supply was one of the first things considered, and while we found that the majority of the people had their own cows, yet breast-fed infants were not infected and nearly all the families supplied by the one milkman contracted the disease. In this epidemic there were no complications and no deaths.

DR. SOUTHWORTH.—The more I see of the eruptive diseases the more hesitation I have in making an immediate diagnosis on account of the infinite variety of eruptions that occur in children, but I believe that all such cases should be quarantined until we can be absolutely sure. As one's experience becomes larger he finds great variations from the cut and dried classifications of the text-books.

DR. PUTNAM.—In the case where no desquamation occurred did the doctor examine the bit of dry skin at the back of the nail? I had a case under close observation of a girl known to have been exposed to a well-marked case. She developed a slight rash and a slight sore throat. The tongue could not be called a strawberry tongue. Next day there was absolutely nothing to be seen. She was kept isolated several weeks, but at last went to the country home, and in a short time another child of the family came out with a perfectly plain case of scarlet fever. I went down to examine her again and found nothing but a slight translucency of this bit of cuticle at the back of the nail to which I have referred, yet I feel sure she had scarlet fever.

DR. HAND.—As to the importance of the diagnosis between scarlet fever and rubella, it reminds me of a position I was in last winter. A child developed a rash the day before Christmas, with fever and rapid pulse. The throat was a little red. The rash was such that I had to call it scarlet fever, and when I announced the diagnosis the mother said, "It could not have been at a worse time, as the room is full of Christmas presents being sent out to friends." If I had not called it scarlet fever those presents would have been sent out. In a few days there was nothing to be seen at all, but three weeks later there was desquamation around the finger-nails, to which the President has just referred.

I do not attach much importance to the absence of desquamation on the body in private practice, as it is my custom to have the patient receive a daily inunction of oil or carbolized vaselin.

Dr. Griffith.—I have seen two undoubted attacks of scarlet fever in the same patient, and shall report the case at a future time.

Dr. Miller (closing remarks).—As regards second attacks of scarlet fever, I take the stand that there are so few authentic that I do not think they should be considered. My object was to try to show that there is a disease—scarlatinous rubella—which so closely resembles scarlet fever that in isolated cases it is impossible to make the diagnosis, and that rubella scarlatinosa occurs both epidemically and in isolated cases, and that all such cases should be treated as scarlet fever for the protection of the public and the patient. I believe that some cases of mild scarlatina are in reality rubella scarlatinosa, and the converse of this is also true, so that we should be very careful in diagnosing rubella.

Unusual Cases of Bromide Eruption in Children.—F. C. Knowles (*New York Medical Journal*) gives an elaborate exposition of this subject, and adds the histories of 4 personal cases. His summary is as follows: (1) Bromide eruption may occur in those who are susceptible, independent of the dose of the drug or of the length of administration. The larger the dose or the longer the ingestion, the greater is the chance of an outbreak; (2) in most cases there are practically no constitutional or subjective symptoms; (3) because of the slow elimination the eruption may continue for some weeks after the drug has been discontinued; (4) almost any type of eruption may be present in childhood; the lesions are usually larger and more persistent than in adult life. The extremities and the face are the parts most frequently attacked; the most extensive eruption occurs in the majority of cases on the legs; (5) lesions have great tendency to occur at points of previous inflammations, such as on vaccination scars, injuries, etc.—*Medical Record.*

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THE RELATION OF DUODENAL ULCERS TO ATROPHIC CONDITIONS OF INFANTS.*

BY HENRY F. HELMHOLZ, M.D.,
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In a previous communication† the author reported 9 cases of pedatrophy that were complicated by duodenal ulcers, all of which were observed in the very short period of three months. During the two months following no cases were diagnosed or found at section, and it seemed as though there must be some unsuspected cause for the appearance of so many of these ulcers in so short a period of time. At this date, however, it is possible to report 7 additional cases, 3 from the Berliner Kinderasyl, 3 from the Breslauer Children's Clinic, and 1, through the kindness of Dr. Schmoller, from his Säuglings-Fürsorge-Stelle, making a total of 16 cases which have been observed in a period of six months. The fact that this large number of cases of duodenal ulcer seen during six months is practically equal to the number reported in the entire literature would make it seem probable that these ulcers occur more frequently than the literature would tend to indicate. Leaving out of account those cases of duodenal ulcers found in melena of the newborn, this pathologic condition is rather infrequently observed in later infancy according to Fischl,‡ who could find but a single case of this kind.

There are, however, a considerable number of cases described in older infants. Through the kindness of Dr. Birk, the author is able to cite from an as yet unpublished article 8 cases of duodenal ulcer which have been observed in the Breslauer Children's Clinic during the last ten years in infants between the ages of eight weeks and ten months. Of these cases, 3 occurred in cases of pyloric stenosis, the fourth in a case of pylorospasm, 2 complicating acute pneumococcic infections, and the last 2 in normally developing infants who had been perfectly well up to a day or two before death, which was the result of acute hemorrhage. A case similar to the last 2 was reported by Veit§—a normally developing, breast-fed infant suddenly started to vomit bloody fluid and died within twenty-four hours as the result of hemorrhage from a duodenal ulcer. Duodenal ulcers complicating pyloric stenosis are more frequently reported. Bloch,* in his series of cases of pyloric stenosis, reports one in which, at section, a perforating ulcer was found. Similar cases are reported by Arreger,† von Torday,‡ and Freund.§ Küttner‖ described a case in which, after recovery from melena a few days after birth, a relapse on the thirtieth day resulted fatally. Here also an ulcer was found in the duodenum. Borland¶ describes a case which can be classified with those two of Birk's complicating acute infections; it is a case of impetigenous eczema that died from acute peritonitis caused by a perforating ulcer.

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* From the Berliner Kinderasyl, Clinic of Professor Finkelstein, and the Breslau University Children's Clinic, Director Professor Czerny.

† Deutsch. med. Woch., No. 12, 1909.

‡ Jahrb. für Kinderhk., Vol. LXIII., p. 563.

§ Deutsch. med. Woch., Vol. VII., p. 681, 1881.

The only two reports of duodenal ulcers found in atrophic infants are one cited by Fischl, and reported by Vanderpoel, in a ten-months-old child suffering from chronic colitis, in which death was the result of hemorrhage from a duodenal ulcer; and a second reported by Birk in a six-weeks-old infant, who had gradually lost weight from birth and died quite suddenly in collapse from a peritonitis caused by a perforating duodenal ulcer. With these last 2 cases must be mentioned the 9 recently reported by the author in atrophic infants.

It seems quite probable that duodenal ulcers in atrophic infants are of quite common occurrence. The fact that in six months' observation the number of cases reported in the literature has been practically equaled, makes it seem probable that these ulcers are often overlooked, especially when attention is not called to them by such special features as hemorrhages, peritonitis and pyloric stenosis, as was the case in all the reports of them in the literature up to this time. Even where there is hemorrhage from the bowel, which in an atrophic infant is practically pathognomonic of an ulcer, it may be overlooked, as is probably the fact in a case of fatal hemorrhage in an atrophic infant reported by Bloch.** The difficulty of seeing the ulcers, even when one is searching for them, is very great, so that it is hardly to be wondered at that they are often overlooked when one sees the manner in which the intestinal canal of infants is usually examined at section. It is only when there are hemorrhages in the ulcer that they are readily seen. A case in point: An atrophic child died as the result of profuse rectal hemorrhages, which made it practically certain that there was a duodenal ulceration. At section, however, on examining the duodenum by gaslight, it was impossible to find the ulcer in spite of its large size (0.6 x 1.8 cm.), so exactly matched was the color of the base and of the mucosa and so thickly was the ulcer covered with sticky mucus that no unevenness of the surface could be detected. The postmortem discoloration from the bile passages may further hinder the finding of the ulcers. The fact that duodenal ulcers are overlooked in the routine pathological examination I have had several opportunities to verify. It seems probable that in a larger per cent. of melena of the newborn more diligent search will reveal ulcerations to explain the bleeding either in the duodenum or in some other part of the intestinal canal.

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* Jahrb. für Kinderhk., Vol. LXV.

† Ueber Pylorusstenose in Kindesalter Inaug. Diss.. Zürich, 1896.

‡ Jahrb. für Kinderhk., Vol. LXIII., p. 563.

§ Mitteilun, a. d., Grenzgebieten der Medizin u. Chirur., Bd. XI., S. 326.

‖ Küttner Berlin Klin. Woch., Vol. XLV., 1908.

¶ Lancet, 1903, Vol. II., p. 1084.

** Jahrb. für Kinderhk., Vol. LXIII., p. 421 (Case IV.).

A method which has been of good service to insure the finding of all the ulcers is the following: The duodenum is spread out flat on a piece of blotting paper and allowed to harden in formalin. Cross sections, 2 mm. in thickness, are cut of the entire duodenum and each section in turn is held up against a light background. In this way the ulcers are readily seen as small cup-shaped indentations in the otherwise smooth surface of the mucosa. Sometimes the hardening alone will bring out ulcers which were not visible in the fresh state.

Etiologically, there is little in the microscopic appearance of the ulcers which would help to clear up their pathogenesis. The ulcers in Case VI. are of interest in that they represent the type of simple ulcer in its acute stage in which nothing but a loss of substance is seen with a thin hyalin layer of necrosis separating the normal tissues from the ulcerated surface. This is much in contrast with several of the acute ulcers described in the last communication where the fresh ulcers showed a very marked inflammatory infiltration. Whether one represents a higher degree of resistance to the ulcerative process or whether they must be considered as of different pathogenesis cannot be answered from a histologic examination of the ulcers. In none of the sections was there anything that pointed toward the mycotic origin of the ulcers. The cases were not examined bacteriologically, however, so that the part played by the bacteria, if any, must be left an open one.

Birk, in discussing the etiology of the ulcers complicating pyloric stenosis, thinks that the spasm of the stomach musculature may be associated with a similar condition of the arterioles, causing insufficient nutrition of the mucosa, leading thus to the ulcerative process. This theory, first advocated by Klebs, is further supported by the experimental work of Talma, who succeeded in producing gastric ulcers in rabbits by stimulating the cut pneumogastric. Strange, however, as Birk also states, is the fact that the ulcers should be found in the duodenum and not in the stomach. Inasmuch as duodenal ulcers are so often a complication of atrophic conditions in infants, it seems more probable that the ulcers are related to the extreme atrophy rather than to the spastic condition of the pylorus. Furthermore, in view of the fact that these ulcers are frequently found directly behind the pylorus in cases without stenosis, it would seem improbable that they have any causative relation to the pyloric stenosis, as maintained by von Torday.

The argument mentioned above holds also for Case VI., in which the atrophic condition was due to a miliary tuberculosis. It seems certain that in this case, similar to those cases of pyloric stenosis, the ulcerations are related to the weakened, atrophic condition of the infant and not to the tuberculous virus, the latter relation being excluded by the microscopic examination of the ulcers. Any definite relation between the ulcers and a particular kind of nourishment seems very improbable when one considers the great variety of milk combinations that the children received.

The pathologic anatomy of the ulcers is covered almost entirely by that given for the gastric ulcer of the adult. From the very acute ulcer (Case VI.), in which the ulceration is hardly to be distinguished from an artefact, to the old chronic ulcer, which is characterized by the proliferation of connective tissue which on the surface has undergone hyalin necrosis. An interesting feature histologically was the healing process in three of the ulcers of Case IV., especially the possibility for one ulcer to keep on extending and lead to vascular erosion, while at the same time several ulcers in the immediate vicinity are healing. The healing ulcers were all superficial. In two of them several acini of the glands of Brunner are still to be seen in the base. Where this remaining glandular epithelium is in contact with inflammatory tissue it loses its glandular characteristics and reverts to the type of surface epithelium. By proliferation, sprouts of epithelium grow upward and tend to cover over the ulcerated surface. In the submucosa, also, the epithelium can be seen growing out in long, single layers from a glandular acinus. From the sides the epithelium grows in and unites with that which has grown up from below. In this manner a superficial ulcer can heal without leaving the slightest trace behind.

Symptoms.—In only 3 of the 7 cases did the ulcers show any symptoms whatsoever. It is not until the ulcerative process has eroded a vessel or perforated into the peritoneum that it is possible to diagnose the ulcer. In none of the cases did vomiting call attention to the possibility of an ulcer. Even a widespread peritonitis may give no symptoms, so that hematemesis and melena remain practically the only symptoms by which we can diagnose the ulcers, and when these occur the child is practically beyond our aid. In the majority of cases the hemorrhages occur, at the most, one or two days before the exitus. The blood in the stools is usually intimately mixed with the feces, giving them a uniform, tarry appearance. If the hemorrhages are large the blood may appear unchanged in color and oftentimes in large clots. The stools of the cases in which the ulcers gave no symptoms were not examined chemically for blood. The pathologic histology of the ulcers, however, makes it seem probable that small vessels are not infrequently eroded and the small amount of blood thereby escaping, although not macroscopically seen in the stools, might give the chemical reaction for blood. Before it will be possible to give an adequate idea of the malignancy of these ulcers, a large number of autopsies of atrophic infants must be done, with special attention to the duodenum, in order to determine in what per cent. these ulcers are present without giving any symptoms. It seems probable that these ulcers are present in a much larger number of cases than is at present suspected, and that in comparatively few the ulceration progresses to erosion of a vessel or to perforation.

The *Prognosis* of a diagnosed duodenal ulcer is very serious, not only because of the danger of rapid death from hemorrhage or peritonitis, but also because the greatly reduced vitality of the infant makes it very susceptible to complications of the lungs (paravertebral pneumonia) and renders the feeding problem still more difficult.

Treatment.—There is little that is of any value to arrest the hemorrhage. In very acute cases the transfusion of blood, which has been successfully performed in melena of the newborn, might be tried. To combat the loss of fluid, physiologic salt solution may be given per rectum and hypodermically. When the infant has recovered from acute symptoms it is very essential that it receive breast milk, beginning with very small amount (90 to 100 grams per kilogram of body weight), and only after the child has ceased losing weight should the amount be slowly increased.

In concluding, I should like to express my thanks to Professor Czerny and Professor Finkelstein for their kind interest in this work and to Dr. Schmoller for his notes of Case IV.

The histories of the cases and pathologic findings are, in short, as follows:—

CASE I. Herbert Dunkel, ten weeks. Born October 18, 1908. Admitted November 30, 1908. Breast-fed for one week, then two-thirds milk and water as often as child cried. On admission child was fairly well nourished and weighed 3,040 grams.

Examination was entirely negative. Lost weight steadily on 5 × 100 grams of M. S.* daily. On December 9th M. S. changed to 3 × 120 grams R. B.† + 2 × 120 grams B. L.‡; gained fairly well until December 12th, when patient acquired a bronchitis; stools at the same time became thin and watery. On December 14th patient was given only tea and the following day 5 × 60 grams R. B. + 5 × 20 grams Br. M.§ This stopped the drop in weight, now 2,680 grams. The temperature had returned to normal, and the lungs had cleared up. On the following day, December 19th, there was another drop in the weight and sudden exitus in collapse.

Section twelve hours after death.

Anatomical Diagnosis.—Pedatrophy, ulcera duodeni. Heart normal. Lungs showed paravertebral hyperemia, otherwise negative. Spleen rather firmer than normal. Liver of dark purplish brown color, intensely congested. Stomach practically normal.

Duodenum.—The duodenum is discolored by the adjacent gall bladder. On opening, there are seen two moderate-sized ulcers, measuring 0.2 x 0.3 cm. and 0.3 x 0.5 cm. respectively. The smaller lies about ½ cm. below the pyloric ring on the posterior wall, the larger also on the posterior wall just over the head of the pancreas, the lobulated structure of which can be distinctly seen in its base. In the mucosa bordering on the ulcers there are small punctate hemorrhages.

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* Malt soup according to Dr. Keller.

† Unmodified buttermilk.

‡ Buttermilk with 5% Liebig sugar.

§ Breast milk.

Ileum, with the exception of slight hyperemia of the Peyers patches, nothing abnormal. Colon normal, except for slight swelling of solitary follicles. Kidneys were normal.

Microscopic Examination of the Smaller Ulcer.—There is considerable postmortem change. The ulcer, however, is very clearly marked by its sharp cut edges which extend down into the submucosa. In about the middle of the ulcer the remains of several Brunner's glands are to be seen, in which there is considerable blood pigment. The entire base of the ulcer is densely infiltrated with small lymphocytes, especially marked about several large vessels that lie very near the surface.

CASE II. Ernst Molitor, six weeks. Born November 1, 1908. Admitted November 30, 1908. Died January 12, 1909.

Past History.—Birth normal. One-third milk and water 100 c.cm. every three hours. Stool? On admission, fairly well nourished child. Slight eczema of cheeks. Weight, 3,200 grams. Nourishment 3 × 110 grams B. L. + 2 × 100 grams R. B. Increased in weight up to 3,420 grams, when dyspeptic stools set in, and weight began to fall. Because of bad condition the child was given allaitement mixte, 5 × 30 grams Br. M. + 5 × 60 grams R. B. Weight continued to drop rapidly. In the last four days of life weight dropped from 3,200 grams to 2,700 grams. During this period the temperature was continuously subnormal, and the pulse low (80 to 100). At no time was there any blood in the stools. The child died quite suddenly on January 12, 1909.

Section January 12, 1909.

Anatomical Diagnosis.—Atrophy ulcera duodeni. Markedly emaciated child. Heart and lungs normal. Spleen, liver and kidneys show no pathologic change. Stomach normal.

Duodenum.—On opening the duodenum three small ulcerations about the size of a lentil are seen, having the typical punched-out appearance of the peptic ulcers. The ulcers are grouped together about 1 cm. below the pylorus. The intestinal canal was otherwise negative. Ulcers were not examined microscopically.

CASE III. Grete Schulze, three months. Born October 26, 1908. Admitted January 13, 1909.

Past History.—Birth normal. Up to the time of admission received 120 c.c. of barley gruel every three hours. Stools normal. On admission, very markedly pallid and weakened infant. Temperature, 34.1°C. Weight, 2,770 grams. January 14, 1909: In spite of hot-water bottles temperature would not rise (34.2°C.). Pulse, 96. Weight, 2,650 grams. Nourishment, 10 × 20 grams Br. M. Had but one stool while in the hospital; this was normal. Child died the following morning.

Section January 15, 1909

Anatomical Diagnosis.—Pedatrophy, ulcus duodeni. Very markedly emaciated child, with practically no subcutaneous fat. Organs all apparently normal.

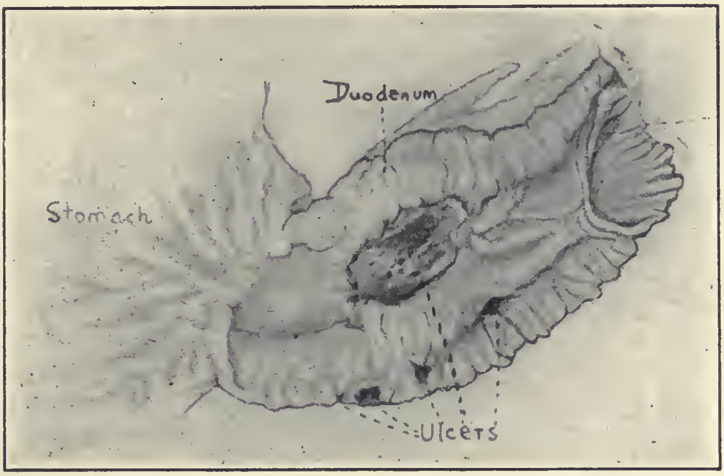
Duodenum.—About 1 cm. below the pyloric ring there is a large solitary ulcer about the size of a ten-cent piece. In the base of the typically sharply-cut ulceration there are several small hemorrhages about the size of a pin head. With this exception the intestinal tract was entirely normal. By mistake the ulcer was not saved for microscopic examination.

CASE IV. Hans Ulrich, three months. Born September 4, 1908. Birth normal. Seen for the first time by Dr. Schmoller on September 12, 1908. Marked rhinitis and dyspeptic stools. Weight, 2,700 grams. Gained slowly in weight up to 3,000 grams on November 10th, when a second attack of dyspepsia set in. Marked reduction of the amount of nourishment decreased the number of stools, but the general condition of the infant grew steadily worse. Pulse, 76 to 80; weight, 2,750 grams. On November 26th child had two brownish-black stools that colored the diaper red. Marked pallor. Vomited several times. November 27th: This morning child had two more copious dark-red stools containing several blood clots. Child died at noon.

Section three hours, postmortem November 27, 1908.

Very markedly atrophic infant. Rigor mortis marked. Edema of hands and feet. Slight remains of a healed eczema on abdomen. On opening the peritoneum the intestinal coils have a peculiar bluish-gray color, and are moderately filled with a semi-solid material. Heart small and flaccid. Clots of very light color. Thymus small and atrophic. Lungs normal. Liver is of a deep purplish-brown color and contains much blood. Stomach: Mucosa is covered by a thick layer of tenacious mucus.

Duodenum is filled with thick brown masses of partially digested food mixed with blood. On the removal of this material there is seen a large, deeply-cupped ulceration on the posterior wall about 1 cm. below the pylorus. The ulcer measured 1.5 x 0.7 cm. On one side the ulcer shades off gradually into the mucosa, on the other it extends deeply down into the retroduodenal tissues, the duodenum being undermined and the mucosa overhanging, as seen in Fig. I. The greater portion of the base of the ulcer is made up of the retroduodenal tissue, the duodenal wall having been entirely destroyed. A tracery of vessels can be seen in the base, and especially prominent is a small venous loop, which has apparently been eroded at three points which are covered by small clots. Besides this large deep ulcer there are four smaller ones on the anterior wall, placed on almost a straight line from pyloric ring to the papilla of Vater. Three of them are of about the same size, measuring about 0.3 cm. across; the other is considerably smaller, only 0.1 cm. in diameter. The larger ulcers are sharply cut and have a greenish, necrotic-looking base; the smallest one is recognized principally by the minute cup-shaped depression that it forms.



SHOWING FOUR SMALL ULCERS AND ONE LARGE ULCER.

Jejunum, ileum and colon are filled in their entire length with a continuous mass of reddish-brown material.

Microscopical Examination.—Of the five duodenal ulcers the four small ones were examined microscopically. The most striking feature of these ulcers, much in contrast to all of the others examined, were the marked regenerative changes, especially of the epithelium, in one case merely an ingrowth of epithelium from the sides, in a second a partially covered over-ulcerated surface, and in a third an almost completely healed ulcer.

Of the four ulcers only one, the largest, shows the typical peptic characteristics. The edges are sharply cut through the mucosa and submucosa, and the base is made up of a broad hyaline band of the inner muscular layer. In several places the inner muscular layer has been entirely destroyed; the outer is intact throughout. On one side the surface epithelium has grown in under the hyaline portion of the ulcer base for a short distance. In the mucosa, on either side of the ulcer, there are several small cysts containing pink granular material and lined by normal-looking epithelium. Where the alveoli of the Brunner's glands come in contact with the proliferating connective tissue there is a distinct change in the gland cells, approaching very closely the appearance of the surface epithelium; the cells become narrower, the protoplasm less granular and deeper staining. The nuclei are relatively larger, move up nearer the middle of the cell and lie with their long axis parallel to the long axis of the cell.

The second ulcer, of somewhat smaller size, can be divided into two parts—one in which the Brunner's glands have been entirely destroyed, and the other in which there still remain a few glandular alveoli in the partly hyaline connective tissue. The epithelium, which undoubtedly is what remains of the glands of Brunner, has taken on the exact character of the surface epithelium, and at several points the mouth of a gland can be seen opening on the surface of the ulcer and the epithelium growing out to either side very much like an island of transplanted skin growing out over a raw surface. The muscle layers are not involved in the ulcer.

The third ulcer is very superficial, but in several places extends down to the inner muscular layer. In the middle of the ulcer the glands have been well preserved; on either side the ulcer extends deeper, most of the gland elements being destroyed and the base made up of a hyaline connective tissue, necrotic on the surface. In the deeper layers there is considerable small, round-celled infiltration. On one side of the ulcer there is a remarkable outgrowth of a single layer of epithelium, starting from a single gland alveolus. This single layer of epithelium lines a space that has been formed in the loose submucosa tissue. In another place there is a similar outgrowth, but of lesser extent. Here, as in the other ulcers, the gland type of cell has been replaced by one of the surface type.

In the fourth and the smallest of the ulcers the healing process has proceeded the farthest; the epithelium has almost completely covered the entire ulcerated surface. Here again it is apparent what a large part in this process the Brunner's glands play, how the raw surface has been covered in part by the upgrowing gland cells. The bizarre form of the gland alveoli shows that there has been considerable proliferation to form new glandular alveoli.

CASE V. Alice Kitzmüller, one month. Born August 5, 1908. Birth normal. Bottle-fed from birth—one part milk and three parts gruel. Has vomited almost constantly after feedings. Stools had been black the day before admission. Weight at birth, 3,000 grams. On admission, very pale, anemic infant weighing 2,200 grams. Had one blackish-red stool. The following day, infant moribund; breast milk, which was given in small quantities, was vomited almost immediately, tinged with blood. Died during the afternoon.

Section, same afternoon, disclosed a large perforating ulcer of the pars horizontalis of the duodenum, causing a fibrinopurulent peritonitis and the large hemorrhages. Organs otherwise negative.

CASE VI. Alfred Gerlach, three months. Born December 10, 1908. Died February 11, 1909.

Past History.—Birth normal. Breast-fed from birth. Seen for the first time February 8, 1909. A weak, pale, atrophic child without any definite physical signs anywhere. Coughs considerably. February 11th: Had several black tarry stools yesterday. Died early this A.M. without any special signs. Weight, 3,000 grams.

Section February 12, 1909.

Heart normal. Lungs: Large tuberculous cavity in right lung; disseminated conglomerate tubercles of both lungs; tuberculous bronchial lymphadenitis. Spleen: Conglomerate tubercles. Miliary tubercles of liver and kidneys. Stomach normal.

Duodenum.—On the posterior wall of the duodenum there are three ulcers situated about midway between pylorus and papilla of Vater over the head of the pancreas. The largest of the ulcers is very characteristic, with its sharply cut outlines, that make it appear as though it had been cut out with a die. No signs of hemorrhage are seen in the base or in the mucosa at the edges of the ulcer. Later, while removing tissue for microscopic examination from the duodenum, two more small superficial ulcers were discovered, recognized merely as small cup-shaped depressions.

Ileum: Scattered throughout its length are numerous small tuberculous ulcerations, which from their relation to the vessels seem to have been of hematogenous origin. Colon shows numerous small tuberculous ulcers.

Microscopical Examination of Duodenal Ulcers.—The largest ulcer is, of all the ulcers examined, the one that shows the slightest reaction; the first impression is that a portion of the duodenal wall has been scooped out with a dull instrument. The ulcer rests directly upon the pancreas, being separated from it by a thin layer of muscle. The mucosa and submucosa are gone. In about the middle of the ulcer there lies a large artery that is cut longitudinally for some distance. The upper wall has been destroyed; the lower is in part well preserved, in part necrotic, showing no nuclear staining. In the vessel there lies a clot which is made up almost entirely of platelets, and a few leukocytes scattered here and there. This erosion undoubtedly caused the tarry stools mentioned in the clinical report. There is a complete absence of any cellular infiltration. The other ulcers are also very typical, showing practically no reaction, but a clearly defined hyaline necrotic zone on their entire surface. The smaller one extends down into the glandular layer, the other has partially involved the inner muscular layer.

CASE VII. Karl Lebeck, seven months. Born August 15, 1908. Admitted September 30, 1908.

Past History.—Normal birth. Breast-fed one week, then one-third milk with gruel. On admission, acute digestive disturbance, with diarrhea and vomiting. After receiving no food for forty-eight hours given increasing amounts of breast milk 5 × 100 c.c. daily. Weight remained stationary, at about 3,500 grams, until November 15th, when buttermilk was added, and by December 11th weighed 3,900 grams. At this time food changed gradually to one-half milk and gruel, 5 × 120 c.c., with about 5 grams of malt extract added to each bottle. Reached 4,570 grams on January 20, 1909. "Maltose" substituted for malt extract with disastrous result; weight rapidly dropped to 3,640 grams by February 15, 1909, with all the signs of an acute intoxication. By February 28, 1909, had again reached 4,100 grams. On March 6th a second acute intoxication set in which, in spite of immediate withdrawal of all food, proved fatal on March 15, 1909. Weight, 3,560 grams.

Section March 16, 1909.

Markedly atrophic infant. Lungs show slight paravertebral hyperemia. Heart normal. Spleen slightly enlarged and firmer than normal. Kidney and liver normal. Stomach shows nothing abnormal.

Duodenum.—Midway between the pylorus and the papilla of Vater there is seen on the posterior wall a small cup-shaped depression about 0.3 cm. in diameter, and sharply distinguished from the mucosa by its greenish colored base. The ulcer is sharply cut out and extends quite deeply into the duodenal wall. There are no hemorrhages either in the base or in the wall.

Microscopic sections of the ulcer show it to be an old chronic one, with marked proliferation of the connective tissue in the base without any infiltration except in the submucosa at either side, where there are numerous lymphocytes, especially about the vessels.

TOXICITY OF MOTHER'S MILK.—Raymond Francois (*Journal de Médecine de Paris*) believes that he has seen cases in which the milk of its own mother has been an evident poison to an infant, while it would thrive on the milk of a wet nurse or on artificial feeding. He believes that there are conditions in which the human milk has a toxic effect on the infant. This poison is evidently in the milk, and is due in general to some form of intoxication in the mother, the poison of which is carried over into the milk. It has been shown that coloring and other matters, diphtheria, antitoxin, etc., are carried over into the milk. Menstruation, dyspepsia, constipation, and similar conditions may produce this poison.—*Woman's Medical Journal.*

BACTERIAL VACCINES IN CHILDREN'S DISEASES.

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This paper does not deal with the theories of immunity, but simply records the results obtained in the use of autogenous vaccines in certain infective processes in children. For the sake of brevity the writer has chosen but 8 cases, each representing a general type of infection on which he has used vaccines, but his conclusions are based on the outcome of all the cases on which he has used the vaccine treatment.

The paper reports the following cases:—

Case I. Chronic bronchitis, following whooping-cough, complicated by acute purulent otitis media.

Case II. Bronchopneumonia, delayed resolution.

Case III. General rheumatic infection.

Case IV. Septic infection after operation for double mastoid.

Case V. Streptococcic empyema following lobar pneumonia.

Case VI. Streptococcic septicemia following acute purulent otitis media.

Case VII. Furunculosis, complicating lobar pneumonia.

Case VIII. Furunculosis following infection from hypodermic injections.

In order that this method of treatment might become better known, and therefore more generally used, a brief outline as to what is necessary in order to prepare a vaccine may well be given.

I. The organism causing the infection must be isolated and grown in pure culture. The organism may be obtained from the blood, sputum, spinal fluid, pus, urine or feces, depending on the type and location of infection.

II. After the organism is grown in pure culture the steps for preparing the vaccine are simple, viz:—

(1) The organisms are grown on some solid medium as agar.

(2) These are scraped off into normal saline solution and shaken until an even suspension occurs. This constitutes the vaccine.

(3) The vaccine is then standardized, *i.e.*, the number of organisms per cubic centimeter are determined.

(4) The vaccine is then heated to 65°C. for thirty minutes to kill the germs. A drop of lysol is added to act as a preservative.

It will be seen, therefore, that a vaccine is nothing more than a known number of the dead bodies of organisms suspended in normal salt solution. If the germs are obtained from the individual to be treated, it is called an autogenous vaccine; if procured from some other source it is called a stock vaccine.

The dosage of a vaccine is based not on the quantity but on the number of organisms per cubic centimeter; hence, if a given vaccine contained 450,000,000 organisms per cubic centimeter and the dose prescribed was 45,000,000 organisms, one would give 0.1 c.c., or estimating 15 minims per cubic centimeter, one would give 1½ minims as measured by the ordinary hypodermic syringe.

The dosage used in cases reported in this paper was about half the ordinary adult dose for the various organisms.

Before presenting the cases in detail, it is well to state that no attempt is made to prove that vaccines were the sole agents in effecting the cures. It has been the aim of the writer to present unbiased reports, not desiring to detract from the usefulness of other measures employed. It is the purpose of the paper to claim for vaccines a place in the therapy of certain infective processes in children, which, until now, have resisted nearly all surgical or medical measures.

CASE I. A. A.

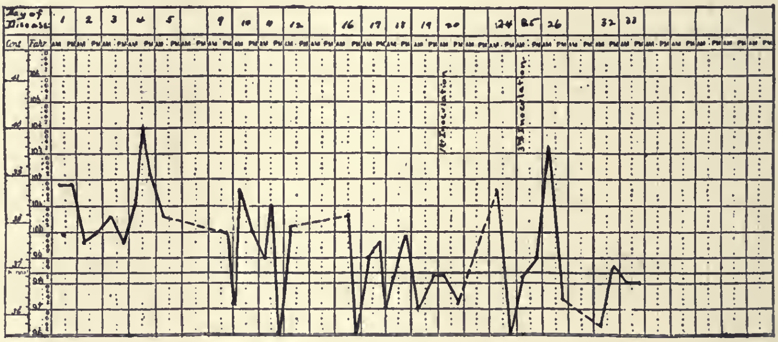
General Statement of Case.—This case is presented as one of a very wide group, viz, chronic bronchitis following whooping-cough, complicated by acute purulent otitis media. Vaccine treatment gave good results. Vaccine made from germs isolated from sputum, being also the same germ which caused the otitis media.

Clinical Detail.—A colored boy, two years old, weak and sickly five months before admission, had had whooping-cough and since then was never free from cough. On date of admission, right ear began to discharge for the first time.

Physical examination revealed râles at both bases posteriorly, breath sounds somewhat harsh but vesicular, percussion negative. Von Pirquet test negative; leukocytes, 17,000; polynuclears, 65 per cent.; hemoglobin, 75 per cent. The child was given liquid peptonoids with creosote and later cod-liver oil and maltine. There seemed to be little, if any, improvement under this treatment. Two weeks after entering the hospital the other ear began discharging.

Detail of Vaccine Treatment, with Results.—Cultures were taken from the ears and from the sputum and both showed pure culture staphylococcus pyogenes aureus. A vaccine was made from the sputum culture, believing this to be the infecting organism.

On the twentieth day after admission the first inoculation of 50,000,000 organisms were given. Three days after 100,000,000 were given; four days after that 200,000,000. After the third inoculation the following bedside note was made: "Boy is improving rapidly, no cough, lungs are clearing rapidly, putting on weight and strength." Several more inoculations were made and patient was discharged forty-five days after admission in excellent general condition.

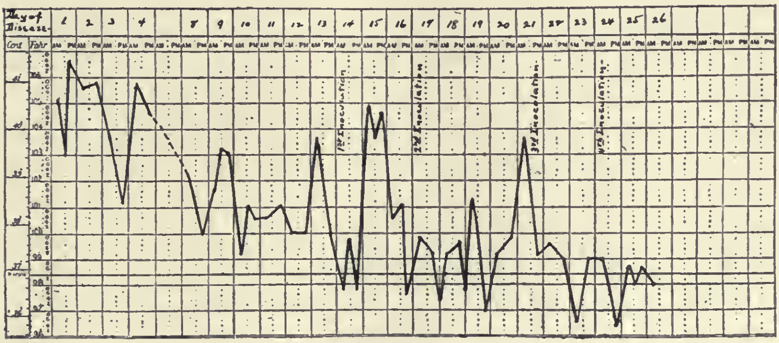


CASE I.

CASE II. C. O.

General Statement of Case.—This case represents another difficult problem met with in respiratory diseases of children, a case of bronchopneumonia in which signs of consolidation persisted for an unusual time. A vaccine was made from the sputum and after four inoculations the child showed much improvement and final recovery.

Clinical Details.—Three days before admission a colored boy of seventeen months had marked fever and prostration; was very restless; had a slight cough. On admission, physical examination showed no changes in resonance. Over both chests posteriorly were heard numerous hoarse, moist râles, and at a point near vertebral border of right scapula, just below the spine, were heard numerous fine moist râles; no changes in quality of breath sounds. On day following admission bronchial voice and breathing were made out over the point where fine râles had been heard, also high up in the right axilla. Two days after admission signs of consolidation were present in upper part of right upper lobe. Ten days after admission consolidation over upper right lobe still persisted. Fourteen days after admission signs of consolidation over left base, posteriorly. Von Pirquet test negative.



CASE II.

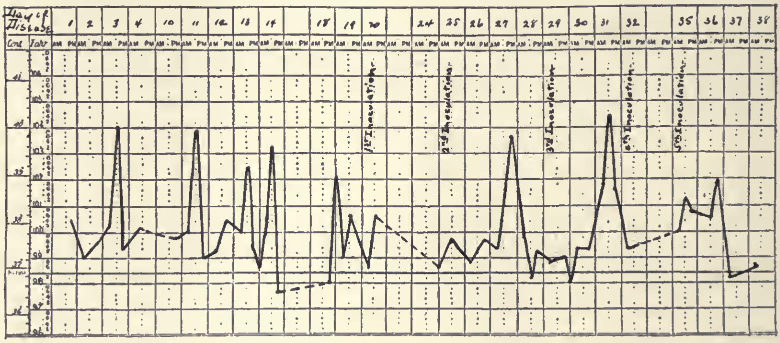
Detail of Vaccine Treatment, with Results.—Fifteen days after admission a culture was taken from sputum, and streptococcus and staphylococcus pyogenes aureus were isolated and a mixed vaccine made. The first inoculation consisted of 30,000,000; three days later 50,000,000 were given and two inoculations each week, of the same dosage, given for the following two weeks. During the period of inoculation the following bedside note describes the progress: "Boy has been improving steadily and especially for the last two weeks has gained weight and strength rapidly. No cough, lungs fairly clear; no consolidation. A few scattered râles at right apex." Discharged, cured, forty-five days after admission.

CASE III. L. M.

General Statement of Case.—This is a case of rheumatic infection with tonsillitis, stiff neck, chorea, endocarditis, swollen, painful joints and urticaria. Cultures from blood positive;

staphylococcus pyogenes aureus being isolated. Vaccine made and child cured.

Clinical Details.—A child of five years was admitted to hospital with a history of tonsillitis, wry neck and joint symptoms for the past two weeks. Father, mother and sisters had rheumatism. A few days before admission began to twitch, gradually lost speech and on admission was not able to walk or talk because jactitations and twitchings were so severe. Physical examination: Facies of adenoids, mouth breathing, tonsils very large, lungs negative, heart faint, systolic murmur heard at apex, transmitted to axilla; extremities, constant choreic twitching of hands and feet; facial distortion at times was marked; could not talk; unable to sit up or walk. During the first twenty days but slight improvement could be noticed, there being a little less nervousness and somewhat better control of muscles. The temperature during this time was very irregular, varying from 104°F. to subnormal, some days not going above 100°F.



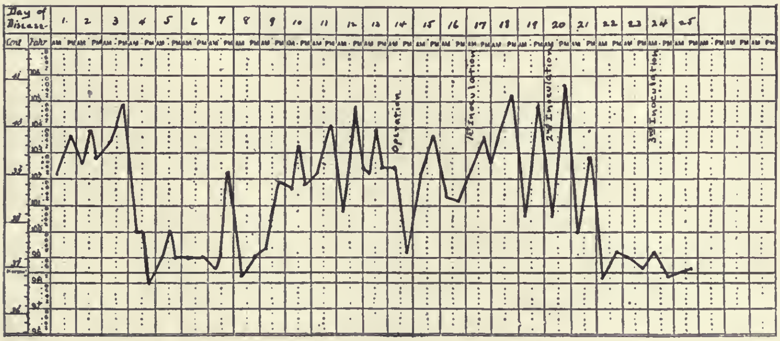
CASE III.

Detail of Vaccine Treatment, with Results.—Cultures from the throat and also cultures of the blood showed staphylococcus pyogenes aureus. Vaccine made and first inoculation given on the twentieth day after admission. The first dose being 20,000,000; second dose, four days later, 57,000,000; third inoculation, four days later, 86,000,000; fourth inoculation, three days after, 120,000,000; fifth inoculation, four days later, 162,000,000.

The child improved gradually under vaccine treatment. The temperature became normal; all choreic movements disappeared and other manifestations of rheumatism were absent. The tonsils, which were believed to be the source of infection, were very carefully extirpated, and after this the child made rapid strides toward recovery, so rapid indeed that the belief that the tonsils were the gateway of this type of infection was greatly strengthened.

CASE IV. A. M.

General Statement of Case.—This case came to operation for mastoiditis involving both mastoids following double acute purulent otitis media. Pure culture staphylococcus pyogenes aureus was secured from pus from both ear discharges. Temperature continued after operation. Vaccine made and administered and temperature came to normal seven days after operation after two inoculations had been given.



CASE IV.

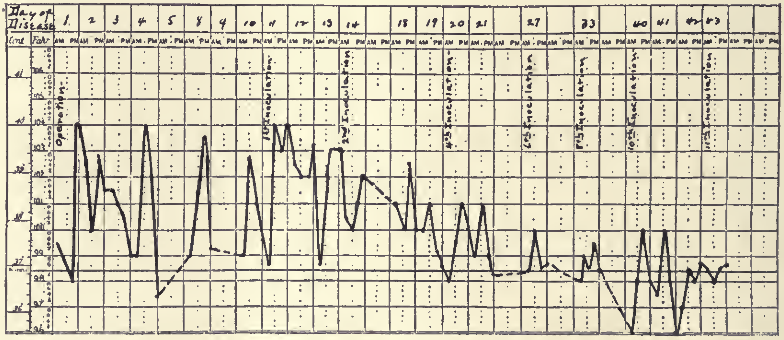
Clinical Details.—A boy of eleven and one-half years was admitted to the medical ward and ran the usual course of lobar pneumonia. Ten days after admission and five days after defervescence complained of earache. Some tenderness made out over the tips of both mastoids. Three days after he was transferred to the surgical ward an operation for double mastoiditis was performed. After operation temperature remained persistently high for the following seven days, reaching as high as 105°F. and of septic type. There was considerable discharge from wounds and several pus pockets were evacuated beneath skin flaps; wound edges became inflamed and erysipelas developed.

Detail of Vaccine Treatment.—Three days after operation cultures were taken and staphylococcus pyogenes aureus isolated.

Vaccine made and first inoculation of 150,000,000 was given on fourth day, temperature at that time being 103.6°F. Three days after that and on the sixth day after operation a second inoculation of 300,000,000 was given. The temperature dropped the following day and came to normal on the day following that. The third inoculation of 450,000,000 was given on the tenth day after operation and another of 750,000,000 on the fourteenth day after operation. The boy made a perfect recovery.

CASE V. E. S.

General Statement of Case.—Child admitted to hospital in a moribund condition. Immediate operation for empyema. Streptococcus found in pus, pure culture. Vaccine made and administered. Child made perfect recovery.



CASE V.

Clinical Details.—A child of sixteen months admitted, with the history that at eighteen days of age it had had lobar pneumonia on the right side. Later pleurisy developed. Five days before admission chest aspirated and pus obtained. Operation not performed at that time. Physical examination revealed the flatness of fluid over the entire right chest. Operation: Rib resected, pus evacuated slowly; large pieces of fibrin exudate expelled; pleural cavity irrigated with hot saline solution; drainage tube inserted. Child returned to ward in very poor condition. During the first week pulse ranged from 124 to 164, respirations from 32 to 72, temperature, septic in type, from 104°F to subnormal. Second week, pulse, 128 to 160; respirations, 34 to 44; temperature septic, reaching 104°F. twice and 103°F. four times.

The condition unimproved. Third week, pulse, 118 to 148; respirations, 26 to 44; temperature not above 102.5°F., more often not above 101°F. Fourth week, respirations, 24 to 36; pulse, 100 to 136; temperature reaching 103°F. on one day, 102°F. on one day, the rest of the time below 100°F. Fifth week, temperature, 101°F. on one day, other times not above 100°F.

Vaccine Treatment, with Results.—A vaccine was made from the streptococcus isolated from the empyema pus. Inoculations were given as stated below.

For the first week no improvement seemed to take place, but after that steady improvement continued. Child has recovered completely and is gaining in weight and strength, in one week having gained from 18 pounds to 19 pounds, 10 ounces. Discharge from wound entirely stopped. The following inoculations were given:—

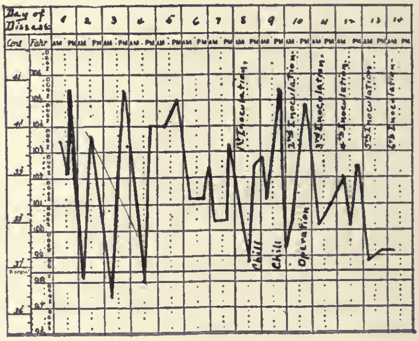
7th	day	after	operation	26,000,000
10th	"	"	"	52,000,000
13th	"	"	"	78,000,000
16th	"	"	"	104,000,000
19th	"	"	"	130,000,000
21st	"	"	"	75,000,000
23d	"	"	"	216,000,000
26th	"	"	"	75,000,000
30th	"	"	"	75,000,000
32d	"	"	"	75,000,000
38th	"	"	"	52,000,000
41st	"	"	"	52,000,000
44th	"	"	"	52,000,000
47th	"	"	"	52,000,000
52d	"	"	"	52,000,000
55th	"	"	"	52,000,000

CASE VI. R. E.

General Statement of Case.—A boy who had complained of earache off and on for six weeks was brought to the hospital. Boy appeared septic. Blood culture showed streptococci. Ear drum punctured and later operation for mastoiditis and sinus thrombosis performed. Autogenous vaccine administered and temperature came to normal six days after first inoculation.

Clinical Details.—A case of a boy seven years of age, admitted to the hospital with the following history: Two weeks previous the boy began to complain of general malaise and headache, which lasted a full week; no chill; no nosebleed; loss of weight and increasing weakness; some night sweats; feverish at night; some earache in right ear, but no discharge (later mother said the boy had been complaining of more or less earache for six weeks).

Physical examination: Poorly nourished, fairly well developed young boy. Skin clean, no lesions, no jaundice. Eyes clear, pupils negative. Head and neck negative. Ears: left, negative; membrana tympanum normal; right, reddened and drum seemed covered with small amount of exudate, not bulging. External auditory canal seemed smaller than left. Chest, lungs, heart, abdomen and extremities negative. On admission, temperature, 103.6°F.; pulse, 104; respirations, 40.



CASE VI.

For the next ten days the temperature was of septic type, reaching as high as 105.4°F. on several afternoons and going to normal or subnormal in the forenoon. Pulse was rarely below 110, and several times as high as 128. On the second day after admission the right ear drum was punctured and some bloody serum escaped. Discharge during the next eight days was very scanty. On the fifth day the patient complained of pain in the left elbow and both knee joints. There was slight tenderness and swelling of these joints. Next day tenderness was made out over the spleen and two days after swelling was noticed in subparotid region. Posterior lymph chain showed enlarged discrete glands somewhat tender but no fluctuations. Swelling in parotid region rapidly increased and operations for mastoiditis and sinus thrombosis were performed. The mastoid was found but very little, if any, involved, and on opening the sinus a small amount of chocolate-colored material was removed. Cultures were taken both from the mastoid cells and from the sinus, and were negative.

Several glands from the posterior chain were removed and were found to be acutely inflamed.

Detail of Vaccine Treatment, with Results.—On seventh day after admission, autogenous vaccine was administered, initial dose being 17,500,000; forty-eight hours later a second inoculation of 50,000,000 was given. At this point the operations above referred to were performed, and on the three days following operations small daily doses of 5,000,000 streptococci were inoculated. The combined result of the operations and the vaccine was that on the fourth day after operations the temperature came to normal and practically remained so and the patient made a perfect recovery.

CASE VII. A. B.

General Statement of Case.—A child three years and ten months of age admitted to hospital and ran the usual course of lobar pneumonia. Ten days after defervescence many small abscesses appeared over the trunk and lower extremities. Several of the larger ones were opened and ung. ichthyolis applied. Many small abscesses continued to appear.

Vaccine Treatment and Results.—Vaccine was made, pure culture, staphylococcus pyogenes aureus having been isolated. Five inoculations of 113,000,000 were given twice a week. After third inoculation bedside note reads: "Furuncles on back and calves of legs are clearing up. No new ones present." After fifth inoculation, this note: "General condition much improved. Furuncles gone."

CASE VIII. F. B.

General Statement of Case.—F. B., aged two years, admitted to hospital with symptoms and physical signs of lobar pneumonia. During the critical stage of pneumonia several hypodermics of caffein were given in the buttocks. In the vicinity of the sites of the injections four or five large abscesses developed and a dozen smaller ones. Several of the larger ones were incised and drained.

Vaccine Treatment and Results.—A culture from pus yielded streptococci. Vaccine was made and inoculations given as stated below. The temperature was but slightly elevated. The abscesses ceased forming and those which had formed gradually dried up, leaving slight induration.

Inoculations were given twice a week; doses as follows: First inoculation, 33,000,000; second, 66,000,000; third, 69,000,000; fourth, 132,000,000; fifth, 165,000,000.

CONCLUSIONS.

(1) Vaccines can do no permanent harm.

(2) Their mode of action is still a question of theory.

(3) Their preparation is simple and their use should become a routine measure in well regulated hospitals for children.

(4) Using the same standards to judge vaccines which are employed in judging the efficacy of drugs or other measures, it would seem that vaccines have favorably influenced every case reported.

(5) In the 2 cases (III. and VI.) in which organisms were found in the blood, the favorable termination may justly be credited to the vaccines used.

Amyluria.—I. S. Wile (*New York Medical Journal,* February 20, 1909) says that the presence of starch granules in urine has been noted by innumerable observers. The general conception of such findings has been that the starch granules are accidental and result from contamination by starch from dusting powder, underwear, etc. In 35 children under observation by the writer amyluria was found fifty times. The precautions taken to exclude contamination and insure favorable conditions for fair observations were: Urine from males only was used; lycopodium was used as a dusting powder; penis washed with a flow of water before securing specimen; penis inserted into a clean bottle and held in place through the use of adhesive straps; bottles covered immediately after the urine was secured; the writer was kept in ignorance of the foods used until after his observations were completed; all centrifuge tubes, test-tubes, glass slides, etc., were tested for starch before utilizing them for the work. A résumé of these observations shows that starch granules are absent from the urine of breast-fed infants, but are frequently present in that of infants on carbohydrate food. The degree of amyluria varies with the nature and preparation of the food, the quantity ingested, and the condition of the individual. Starch in urine at times gives a reaction simulating that of albumin. Starch passing through the kidney may cause albuminuria with casts. Amyluria does exist, and starch in the urine is not necessarily of extraneous origin.—*American Journal of Obstetrics.*

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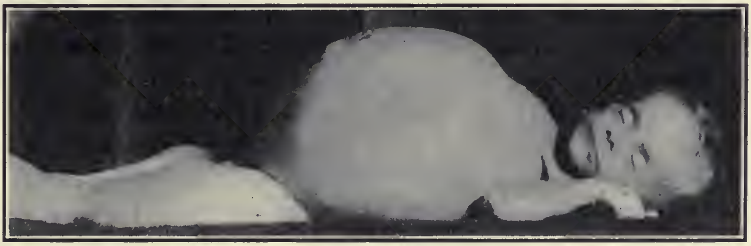
CLINICAL MEMORANDA.

A CASE OF SARCOMA OF THE KIDNEY.*

BY J. FINLEY BELL, M.D.,
Englewood, N. J.

The subject of this report was a male infant four months old, observed February 17th in consultation with Dr. Pratt, of Dumont, when the following history was obtained:—

Baby four months old. Breast fed. At birth normal. Dr. Pratt did not see the patient from birth until the day before calling me in consultation. The mother stated that the enlargement of the abdomen was only of two weeks' standing; that the baby cried a great deal, and for the past four weeks or more had not nursed as vigorously as a normal baby should, and that the urine was diminished in quantity.



SHOWING EXTREME ABDOMINAL SWELLING.

Examination.—The child was much emaciated, with a pinched expression, and an enormous abdomen. The fontanels were open, size and contour about normal. Eyes, nose, ears and mouth normal. *Chest.*—The heart was displaced, the apex beat 1.5 cm. external to the nipple line and in the third interspace the sounds were normal, but weak. Respiratory motion was slight, rapid and mostly costal. Vesicular breathing was diminished and bronchial breathing accentuated. There were no râles. The chest conditions were due to the enormous pressure against the diaphram from below, crowding the thoracic organs upward into the apical portions of the thorax and spreading the chest so that the lower ribs were quite horizontal.

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* Read before the New York Academy of Medicine, Section on Pediatrics, May, 13, 1909.

Abdomen.—The abdomen was very large. The circumference at umbilicus 49.5 cm., largest circumference 51.5 cm.; at the epigastrium 50 cm. Veins and capillaries of the abdominal wall were prominent. There was an umbilical hernia, and the skin was tense and shiny. The entire abdomen was flat on percussion, but no succussion could be elicited. The area of liver dullness was very high. The spleen could not be found. The enlargement of the abdomen seemed at first to be uniform and symmetrical, but on close examination there was greater prominence relatively on the left side. Owing to the marked dyspnea, cardiac embarrassment and severity of pain, the child was removed to my service in the Englewood Hospital on February 17th. That evening he was tapped in several places and 400 c.c. of fluid obtained. Each puncture gave a clear, straw-colored fluid of syrupy consistence for the first 1 or 2 c.c., then it became bloody and thick, finally clogging the cannula. The clearest fluid was taken from the lumbar region on the left side. The removal of this 400 c.c. of fluid made no appreciable difference in the abdominal distention, but there was some respiratory relief. The next day a trocar was introduced in several places with the hope of reaching a large cavity in the sac, in order to relieve the infrathoracic pressure and improve the general condition sufficiently for radical surgical measures later. Several catheterized specimens of urine gave negative results.

My first thought was of sarcoma of the kidney, but later, after repeated failures to relieve by tapping, I concluded we had to deal with a congenital hydronephrosis of the left kidney and that this hydronephrosis was multilocular. It was decided, therefore, to hazard opening the abdomen, incise the cyst, break up the partitions and empty it in this manner. The child being in a desperate condition the parents readily consented, and accordingly, on February 18, 1909, Dr. A. W. Ward opened the abdomen, under chloroform anesthesia, in the median line between the umbilicus and ensiform. For a time respiration seemed to improve under the chloroform, but suddenly, just as the abdominal cavity was entered, respiration ceased and the radial pulse disappeared. Artificial respiration was immediately performed and amyl nitrite substituted for the cholorform. Soon respiration was re-established and oxygen was then administered while the operation was completed. Active stimulation was necessary during the night, the shock being considerable. About 200 c.c. or 300 c.c. of fluid, such as came through the cannula, flowed from the wound and it was dressed with drainage. The baby was unable to suck after operation, but the mother's breasts were pumped and it was fed by dropper.

February 20th, mother's milk had failed, so that a whey cream mixture was substituted alternately for half the feedings. March 7th, mother's milk failed entirely and whey cream constituted the entire diet. The patient continued stationary until the wound refused to drain, when respiratory and circulatory conditions rapidly grew worse. Asthenia became marked, edema of the lower extremities supervened, and on April 3, 1909, the baby died.

While these cases are by no means rare, they occur with sufficient infrequency to make each one interesting. From the history and course of this case, together with autopsy findings, one is justified in making a diagnosis of congenital sarcoma of, or in the region of, the left kidney, its hilum or ureter causing obstructive hydronephrosis, multilocular in character. The various loculi corresponding to one or more dilated compartments or units of the kidney.

May 28, 1909.

REPORT OF AUTOPSY BY DR. D. S. D. JESUP:—

Male child, 5 + months old. Length, 59 cm. Head, chest, and upper extremities much emaciated. Edema of lower extremities and penis.

Abdomen.—Circumference, 58 cm. at navel; distended. Skin tense and shiny. Small linear scar near navel completely healed. On section abdomen filled with large retroperitoneal mass lying more on left side than right. It extends from diaphragm above to symphysis below, and overlies right kidney. It is a thin-walled, multilocular cyst, and running over its surface from region of spleen down to right brim of pelvis are the colon and sigmoid. The mass is adherent laterally on the left side and posteriorly to the muscles. The renal vessels enter and leave it opposite the right kidney. After removal and the escape of considerable fluid from the thin-walled cysts, the tumor, which is ovoid, measures about 20 x 18 cm. The anterior portion is composed of many thin-walled cysts. Posteriorly the kidney structure can be made out, and it is continuous with a soft pale growth, which extends forward through the mass to the cystic portion. There are areas of escaped blood and dark necrotic tissue. Left adrenal not recognized in tumor mass.

Small intestine displaced upward to the right; appearance normal. *Stomach* normal. *Liver* small; congested. *Gall-bladder* distended with light yellow bile. *Pancreas* normal. *Spleen* small; firm; red. *Heart* normal. *Lungs* congested at bases.

Microscopic Examination.—Section from various portions of kidney tumor show a growth of large oval and spindle cells which appear to bear an intimate relation to the connective tissue stroma. There are areas of red cells in the stroma and thin-walled blood vessels distended with red cells. Walls of smaller cysts composed of connective tissue infiltrated by the new growth cells and lined by flattened cells. Sections of the kidney parenchyma show thinned blood vessels, proliferation of cells of the glomeruli, and some increase of connective tissue.

Diagnosis of tumor.—Spindle celled sarcoma, with cystic degeneration.

TYPHOID FEVER IN INFANTS.—J. L. Morse (*Pediatrics,* November, 1908) reports 4 cases of typhoid in infants of from eleven to nineteen months in connection with a milk-borne epidemic. In but 2 could direct exposure to infected milk be proven. The course of the disease in these patients corresponds to that usual at this age. The duration of the fever was comparatively short; the temperature fell by a gradual lysis without marked remissions or intermissions; and signs in the lungs were found more commonly and were more marked than is usual in later life. There were no marked nervous symptoms, but the infants were drowsy and apathetic during the febrile period. The tongue was never very dry or much coated. The relatively slow pulse rate in comparison with the height of the temperature, which is of so much importance in the differential diagnosis of this disease, was not found in these cases. A rapid pulse probably does not count as much against typhoid at this age, therefore, as in later life.—*American Journal of Obstetrics.*

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A CASE OF STATUS LYMPHATICUS.*

BY G. R. SATTERLEE, M.D.,
Attending Physician and Pathologist to the Washington Heights Hospital.

Morris Bleier, two years old, United States, male. Admitted to the Washington Heights Hospital April 10, 1909.

Family History.—There is no history of hereditary diseases. Birth was normal, without instruments. One sister, six years of age, alive and well.

Previous History.—Three years ago had diphtheria; no other diseases.

Present History.—About one month (?) ago had one convulsion during the night. About two weeks later had two convulsions, and four months later three convulsions during the night (no description of the convulsions was obtainable). Since that time patient has had numerous convulsions. The convulsions were ushered in by a crying attack with apparent pain in the lower jaw. Two weeks before admittance patient was X-rayed in the University and Bellevue Hospital College Dispensary, under the supervision of Dr. Long, but the movements of the boy prevented the demonstration of an enlargement of the thymus.

Physical examination on April 18, 1909, showed a boy of about normal size and development for his age, with a well-developed panniculus. The pupils are normal. The lungs are normal, movements of chest symmetrical. There is an area of distinct dullness 2 cm. to the left of the left edge of the sternum in the first and second interspaces, extending on the right almost to the right border of the sternum and above to the upper edge of the manubrium. This area of dullness is continuous below with that of cardiac dullness. This dullness is judged to be caused by an enlarged thymus gland and is confirmed, I think, by the Roentgen Ray plates, taken May 5th. The heart is hypertrophied, both right and left ventricles; the right border is at the right edge of the sternum, the left about ½ inch to the left of the normal position. There is a systolic murmur over the base in the neighborhood of the pulmonic area, not transmitted. (This murmur has since disappeared.) The abdominal muscles are rigid, the area of the spleen percusses dull to a moderate extent, but the organ cannot be palpated; otherwise the abdominal viscera are apparently normal. Evidences of rickets are shown by quite marked bowlegs and an incomplete closure of the anterior fontanel. The right testicle is undescended. There are a few adenoids in the pharynx, the tonsils are very slightly enlarged. The deep cervical lymph nodes are palpable, the superficial posterior cervical, axillary, epitrochlear and inguinal nodes are enlarged. The thyroid gland is slightly enlarged and the superficial veins running down into the region of the thymus are distended, as well as those on the anterior part of the thorax.

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* Presented before the Section on Pediatrics, New York Academy of Medicine, May 13, 1909.

Blood examination on April 14th and 15th showed:—

Red blood cells	4,000,000
Hemoglobin	94 per cent.
Index	1.2
Leukocytes	11,000

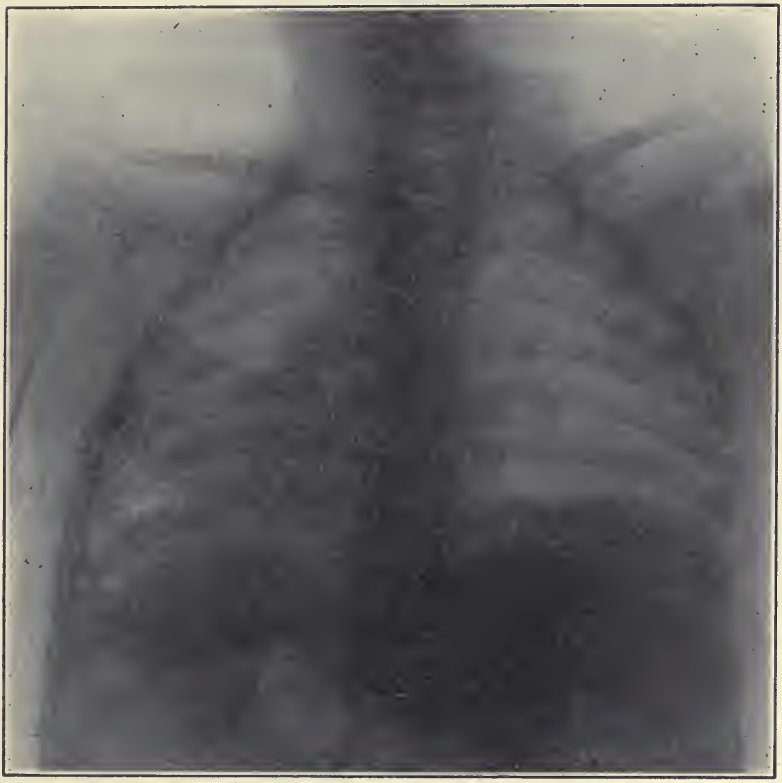
There was slight polychromatophilia, a moderate number of normoblasts, and a few microblasts.

Differential count:—

Polynuclears	67 per cent.
Lymphocytes	23 " "
Large mononuclears and transitional	8 " "
Eosinophiles	1 " "
Basophiles	1 " "

Examination of feces on April 13th. Soft, slimy, stringy, lemon yellow color, very foul odor, microscopically, much mucus.

The temperature was normal during the first seven days in the hospital. On April 10th, after admission, patient had numerous attacks of screaming, when the face would become dusky red, the veins over the larynx deeply congested. April 11th, in the morning, the boy had a convulsion, lasting five minutes, preceded by crying, with cyanosis and a marked inspiratory stridor. In the afternoon he screamed for a half hour at short intervals, followed by a convulsion, lasting two minutes with muscular twitching of the face and eye muscles, and gave short, sharp cries with inspiratory stridor, but no twitching of the muscles of the trunk and extremities. Two more convulsions occurred during the night, making a total of four for twenty-four hours. The treatment consisted in milk diet with milk of magnesia, and high saline colon irrigations, twice a day. April 12th, patient had four convulsions today, the last severer and general over the whole body. April 13th, six convulsions today, lasting two to five minutes each, of the same character. The stools are whitish. April 14th, eight convulsions and one screaming attack lasting one hour.



ROENTGEN RAY PHOTOGRAPH SHOWING ENLARGED THYMUS AND HYPERTROPHIED HEART.

Was given sodium bromide, gr. v. *t.i.d.* April 15th, six convulsions, one lasting ten minutes, followed immediately by another after a mustard bath. April 16th, nine convulsions today, was given chloral hydrate, gr. x. *b.i.d.* April 17th, chloral seems to have controlled convulsions; only one today, but child is too weak to sit up and regurgitates food. Taken home.

Patient was readmitted April 30th with convulsions lasting three minutes. Stridor is much less marked, the color of the skin much improved, takes more notice of people and talks.

Urine on May 8th: Pale, amber, clear, sp. gr. 1,019, no albumin, no sugar, moderate amount of indican.

Cyanosis is present during convulsions, and crying attacks which last steadily over an hour. Is constipated. Saline colon irrigations given.

Diet.—Milk, 8 ounces; milk of magnesia, 2 drams; oatmeal water, 2 ounces, *q. 3 h.* On May 5th X-ray photographs were taken—the first one without an anesthetic, the second and third under light chloroform anesthesia. A short time after beginning of the chloroform the pulse became very irregular and intermittent, but no symptoms of cardiac insufficiency were evident.

The diagnosis of status lymphaticus was made on the enlarged thymus, the dyspnea with inspiratory stridor, the enlarged veins of the neck and thorax, caused probably by the pressure of the thymus tumor, the convulsions, preceded by a crying fit and accompanied by inspiratory stridor. Two other factors have been carefully considered, namely, rickets and intestinal disturbance. Both are present, but do not seem to be the controlling factors. The hypertrophy of the heart and its disturbance in rhythm and rate during chloroform anesthesia also point toward the condition called status lymphaticus.

(The patient was exhibited.)

ON THE USE OF MORPHIA IN AFFECTIONS OF INFANCY.—A. Lesage and Maurice Cléret (*Arch. Gén. de Méd.*, May, 1908) make a plea for the use of morphia in laryngeal affections associated with spasm, in which the antispasmodics generally used are known frequently to fail. They regard as a heresy the old doctrine that opium is unsafe in disorders of infancy, and they employ the hydrochloride of morphia in a 1 per cent. solution, in what one might almost term heroic doses. The initial doses they use by injection, which are repeated if necessary, are as follows: Up to one year of age $\frac{1}{3}$ c.c., in the second year $\frac{1}{2}$ c.c., in the third year $\frac{2}{3}$ c.c., and over three years 1 c.c. Cases thus treated ran a much shorter course and much more rarely needed operative interference than cases in which it was withheld.—*Medical Chronicle.*

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REPORT OF TWO CASES OF EMPYEMA.*

BY OSCAR M. SCHLOSS, M.D.,
New York City.

CASE I. EMPYEMA IN A CHILD AGED THREE MONTHS. OPERATION, RECOVERY.

The patient was admitted in October, 1908, to Dr. Long's clinic at Bellevue Medical College with the complaint of cough, fever, loss of appetite and loose bowels. There was nothing of importance in the family or personal history, the child having been perfectly well until the onset of the present trouble. She had been entirely breast fed.

One month previous to admission she became suddenly ill with cough and fever. According to the mother's story the child was very ill for two weeks and then improved for a few days, which improvement was followed by a recurrence of the illness with gradual development of the symptoms complained of at the time of admission, one month subsequent to the actual onset of the disease. On admission the mother complained that the child took its food very poorly, had three to five loose bowel movements a day and had fever with profuse sweats at night. The cough was frequent, short and hard, with no expectoration.

On examination, with the exception of great emaciation, profound anemia and general enlargement of the lymphatic glands, the abnormal physical signs were localized to the left side of the chest. The left side looked a trifle larger and moved less on respiration than the right. Tactile fremitus, while well marked on the right side of the chest, was absent on the left. The apex impulse was not palpable at the usual site, but could be felt about 3 cm. within the left midclavicular line corresponding to the fifth left interspace. The left side of the thorax was flat on percussion from the angle of the scapula to the costal margin posteriorly, and anteriorly from the fourth rib to the costal margin, while above these points the percussion note showed impaired resonance. The breath and voice sounds were very faint over the whole left side and were not heard at the base of the lung. The right border of the cardiac dullness was 3 cm. to the right of the right sternal margin. There was a well marked paravertebral triangle of dullness on the right side. The temperature was 102°F., the pulse 120 and the respirations 40 to the minute.

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* Read before the New York Academy of Medicine, Section on Pediatrics, May 13, 1909.

These unequivocal signs left little doubt as to diagnosis, and an exploratory puncture showed thick, yellowish pus, from which streptococci and staphylococcus pyogenes aureus were grown.

An incision 2½ cm. long was made in the seventh interspace in the anterior axillary line and about 120 c.c. of pus evacuated. A double drainage tube, No. 20 French catheter size, was inserted. Although the simple operation took but a moment and the pus was allowed to escape very gradually, it was followed by profound collapse. The radial pulse was impalpable, the temperature 95°F. per rectum, and the respirations labored and 80 to the minute. After the usual stimulants (whisky, strychnin and camphor) the child was sent home improved, but it still looked far from promising. The recovery, however, was rapid; the child began to gain in weight from the third day after operation and gained 18 ounces in two weeks. The following day the temperature was 99°F. per rectum, the pulse 100 and the respirations 30 to the minute. The drainage tube was removed in ten days and in two weeks the wound had entirely healed. The day following operation the breath sounds could be heard over the whole left side and at present they are very distinct and but a trifle less intense than on the other side. There is still a little superficial dullness.

Reckoning from the usual data at the outset the prognosis in this case was rather bad. The streptococcic empyema is generally regarded as the most virulent form and there is a general impression, substantiated by the text-books, that infants under six months die more often than they recover from empyema. In this case a simple incision was sufficient, and had a rib been resected at the time of operation I fear that the outcome might have been different, for even this very simple operation left the child in profound collapse. The greatest point in this patient's favor was that it had been a breast-fed baby. It is impossible to determine whether the empyema was primary or whether it was secondary to pneumonia. The history, however, is rather suggestive of the latter origin.

CASE II. POSTPNEUMONIC EMPYEMA, RUPTURE OF THE PUS INTO A BRONCHUS; PULMONARY FIBROSIS; BRONCHIECTASIS.

This patient had pneumonia two years ago and at the end of the third week the diagnosis of empyema was made and operation advised, which was not permitted by the parents. He was very ill for eight months, coughed up large amounts of pus, had fever and sweats every night and lost considerable weight. Ultimately he began to improve; instead of coughing constantly the cough became periodic and several times a day he would expectorate large amounts of pus, often as much as a cupful. The worst spells were in the mornings and evenings. With this improvement he began to gain in weight.

In December, 1908, he was admitted to Dr. Long's service at the New York University and Bellevue Medical College. At that time he had no fever, the pulse was 110, and the respirations 50 to the minute. The fingers and toes showed marked clubbing and the nails were incurved. The patient was fairly well nourished. The left side of the chest was flattened above and bulged slightly below; this side of the chest expanded less on respiration than the right. There was slight scoliosis. Tactile fremitus was absent over almost the whole left lung, though at times there were areas over which a slight thrill was present.

On percussion, the whole left side of the thorax was dull and toward the base of the lung almost flat. There were scattered areas of tubular breath sounds, with occasionally a cavernous quality, over the lower lobe of the left lung. These auscultatory signs varied at the different examinations, being at times very faint, at others well marked. When they were more distinct a "veiled puff" could be heard over some of these areas, and pectoriloquy and bronchophony were also present. Near the apex of the lung were a few medium moist râles, while over the areas of bronchial breathing large moist and gurgling râles were often present.

The left side of the chest measured 4 cm. more than the right at the level of the fourth rib. The heart showed nothing abnormal and the rest of the physical findings were unimportant.

The patient was in the Presbyterian Hospital, on Dr. Northrup's service, eight days, and during this time several exploratory punctures were made with negative results. The white blood cells were never more than 13,000, and the relative percentages of the cells normal. The patient had only occasional slight rises of temperature while in the hospital and under observation, the temperature rarely being above 100°F. The sputum was examined many times for tubercle bacilli with negative results. X-ray examination showed nothing of importance.

During the past two months the child has improved, he has gained weight, has had a good appetite, and has slept well. The physical signs mentioned are still present, but are less marked. The respirations are still rapid.

This patient had a postpneumonic empyema, which was not operated. The pus was removed either by lymphatic absorption or by rupture into a bronchus. According to the history the latter was more likely, the drainage being imperfect. Pleural thickening and adhesions have formed and the lung is probably bound down and adherent.

Has this patient bronchiectasis? The scattered areas of bronchial breath sounds, with the occasional quality and the "veiled puff," the periodic expectoration of large amounts of pus, the absence of pleural effusion and the variations in the physical signs at the different examinations are in favor of this diagnosis. It was never possible to examine this patient before and after expectoration, but this would have been of great assistance in the diagnosis. This case illustrates one of the means by which empyema may result in spontaneous recovery. The pus may rupture externally through the thoracic wall or internally into a bronchus. In the latter event, well shown in this case, the pleura becomes thickened and the lung fibrotic; the thoracic wall becomes flattened and there is a compensatory scoliosis. Bronchiectasis is often a consequence of these changes. It will be interesting to see if this patient develops the bone changes described by Marie, of which clubbed fingers is the first sign.

TREATMENT OF ERYSIPELAS BY CARBOLIC ACID AND ALCOHOL. —Aspinwall Judd, of New York (*Medical Record,* February 13, 1909), recommends the use of strong carbolic acid painted on the surface in cases of erysipelas until the surface is whitened, and then followed by swabbing with alcohol. The treatment must go a half-inch beyond the border of the eruption to destroy all the germs. The unbearable itching, burning and throbbing are relieved at once, fever soon falls, and general symptoms are relieved. The author has treated successfully 67 cases, and 5 cases in which it failed. No scarring results. The superficial layers of the skin come off as in mild sunburn and the complexion is improved.—*New York Medical Journal.*

EDITORIAL.

SQUINT IN INFANTS.

A warning note should be sounded in the interest of the newborn to prevent their sight from being impaired in puberty, and to impress upon the profession, especially upon pediatrists, because of their frequent contact with infants, the importance of early diagnosis and early treatment of squint in infants. By early treatment of this condition in infants, not only will operation be avoided in the majority of cases, but better vision will be obtained, because opportunities will be afforded for the proper development of motility, visual acuity, etc.

Before considering treatment, the cause of any existing ocular abnormality should be ascertained. The most frequent causes of squint are errors of refraction and lack of development of the fusion faculty. The various varieties of squint are but symptoms of their respective underlying causes. Of the various forms of squint convergent strabismus is the commonest. For convenience, it may be classified clinically into the following: (1) Occasional squint; (2) constant monolateral squint; (3) alternating squint.

During the first few months of life, before the faculty of fusion has developed to any extent, convergence for a few moments may be noticed during gastric or other disturbance. This is of little importance, since slow development of fusion is as normal as slow development of speech. An eye may converge for a minute or two occasionally even when a child is old enough to walk; but later, if the fusion faculty is developed normally, the child will have sufficient control of ocular motility to prevent the recurrence of the deviation. However, if an infant crosses his eyes for many minutes, or the deviation is always manifested in the same eye, the case is one of true squint and demands immediate investigation.

With the advent of puberty, a squinting eye may become straight as the result of development of the fusion function, but the result will be merely a cosmetic effect unless the focus of the squinting eye be normal and vision normal, an extremely rare combination. Among several thousand cases refracted annually, but one case is on record where with convergent strabismus present until two and a half years of age the focus in each eye was normal, and the vision normal.

The more common conditions with which the ophthalmologist comes into contact are squints combined with, and resulting from, errors of refraction, principally hypermetropia, occasionally associated with undeveloped sense of fusion.

The mechanism involved in the formation of squint is briefly this: Accommodation and convergence are associated physiologic functions bearing a constant relation to each other. A patient cannot accommodate without converging and vice versa. Take, for example, a pair of eyes, one straight, one converging. The straight eye is two diopters hypermetropic, the converging eye is four diopters hypermetropic. The converging eye, with four diopters of hypermetropia, must of necessity accommodate more than the other, and therefore converge more than the other, unless the eye with the greater error of refraction has become amblyopic through lack of early attention. Congenital amblyopia —the term is soon to become extinct—though theoretically possible can usually be assigned to a definite cause. Any member of the human economy will depreciate in physiologic function in proportion to the length of time that the member is prevented from functionating. So the sensitiveness of the retina will depreciate in proportion to the time an eye is in disuse and to the degree of the existing defect.

In regard to the treatment of squint in infants, it is of paramount importance to begin treatment when symptoms first appear, regardless of age. The first duty of the ophthalmologist is to determine under mydriasis the presence or absence of any error of refraction. Modern methods enable him to determine the refraction of an eye objectively with a remarkable degree of accuracy. If any error of refraction exist, glasses should be prescribed accordingly. After the eyes have been put into proper focus with glasses, a reasonable time, depending upon the age of the patient, should be allowed for development. If, after a few months, any deviation remains, the child should be trained to fuse images and thus retain binocular vision by means of the various methods of ocular gymnastics familiar to ophthalmologists. If the above method is followed, the vision in the squinting eye will have the same opportunity for development as that of the nonsquinting eye, and in most cases operations can be avoided. Should squint have existed a few years or more, the prognosis in the squinting eye would be unfavorable for vision, although the cosmetic effect can be assured in all cases by means of proper operative interference and suitable glasses.

W. H. HOLZAPFEL.

THE RÔLE OF HUMAN CONTAGION IN INFANTILE TUBERCULOSIS.—J. Comby (*Arch. de Méd. des Enf.*, March, 1909) considers the rôle of milk and meat. of food products and intestinal tuberculosis, a small one in the causation of tuberculosis in infants. Children are born neither with tuberculosis nor with a predisposition to the disease. If the children of tuberculous parents are removed immediately from the surroundings in which the parents cough and spit, and are brought up in good hygienic surroundings, they grow up strong and well. If they remain in their homes they die of tuberculosis, derived from the infected house. Pallor, emaciation, narrow chest, and micropolyadenopathy are symptoms not of a tuberculous predisposition, but of latent tuberculosis. Transmission of tuberculosis by heredity does not exist, neither does predisposition. Those who assert that they do are guilty of misinterpreting simple facts. In the immense majority of cases tuberculosis is derived from the family by inhalation. The measures taken against animal tuberculosis and tuberculous milk have been useless, and have not diminished the number of cases among infants. Neither has sterilization of milk. To have a bad effect milk must be full of bacilli from mastitis. If milk was the cause, all the people who drink the same milk should be affected by it. On the contrary, only those exposed to the contagion have the disease. Out of autopsies on 1,447 infants made by the author tuberculosis was found in 536 cases. In all these cases the bronchial glands were infiltrated. The older the children the more frequently was tuberculosis found. If it came from milk the younger children should have it more frequently. Infants who are kept in the home are less affected than those of an age to mingle with the public. Many of the chronic coughs and asthmas of old people are tuberculous, and the disease is transmitted to the infants of the family. Prophylaxis must deal with the removal of all cases from the family, not with the care of milk and meats.—*American Journal of Obstetrics.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Regular Meeting, May 13, 1909.

Dr. Eli Long, Chairman.

BABY WITH CLUB FEET PUT UP IN PLASTER BOOTS.

Dr. Henry W. Frauenthal presented this child in order to bring out a discussion of the proper time to treat *congenital* club foot in children.

Dr. Frauenthal said he could show several cases that had been treated this way in the past six months, and the children had perfectly good feet. Often children were left until the age of five years, when the cure was far more difficult, whereas in the first few months deformity was easily corrected. This baby had very badly deformed club feet, and was about cured in three treatments.

This treatment was in opposition to the opinion of good men, yet they did not get such good results so quickly and so easily.

CASE OF CONGENITAL STRIDOR.

Dr. Charles Herrman presented this case from Dr. La Fétra's service at the Vanderbilt Clinic. The child was born in a perfectly normal manner, and was apparently healthy. When it was two days old the peculiar crowing sound was observed, which has become accentuated since that time. When the child was asleep no noise was made, but when it became excited and took a deep inspiration the noise was very distinct, as also sometimes while it was taking the breast. The examination showed only a distinct dullness over the upper part of the sternum, which might indicate an enlarged thymus. There were two theories in regard to the etiology of this condition—the generally accepted one being that it was due to a congenital malformation of the larynx; and, in addition, as Thomson has believed, there was another factor, *i.e.,* an incoördination of the respiratory muscles. The sound was not heard in expiration. In the case presented there was no marked interference with the respiration, and no retraction or other sign of obstruction.

The other view was that the condition was due to an enlarged thymus, which, by pressure, caused this peculiar laryngeal stridor. Any one who has read Hochsinger's monograph on this subject must have been impressed by the lack of evidence presented. The radiographic pictures which he gave were not convincing. Autopsies have been performed in a number of these cases, and they have always shown this peculiar form of larynx, which would seem to indicate that the form of the larynx was the cause of the trouble. The condition disappears at the end of a year and a half or two years. Medication had little effect on the condition. It simply persisted for a certain length of time and then disappeared.

CASE OF PERSISTENT JAUNDICE.

Dr. Herrman presented an infant four months old, also from Dr. La Fétra's service. The parents were healthy. There was no suspicion of specific disease. There were 10 other healthy children. The birth was normal, the patient was breast fed. On the twelfth day the mother noticed that the baby was jaundiced. It had three or four large white stools daily and no vomiting. The patient was seen at the clinic on April 14th, age three months, weight 10 pounds, 5 ounces. The conjunctiva and skin were yellow, the stools were large, white and pasty, containing only traces of bile, and the urine contained bile pigment. Liver 4 cm. below the border of the ribs in the mamillary line, the spleen 2 cm. Temperature 99.6° F. The patient had been under observation one month and the condition and weight had remained about the same. The intensity of the jaundice and the amount of bile pigment in the urine and feces had varied from time to time. A persisting icterus neonatorum could easily be ruled out. Against sepsis were the absence of fever; the comparatively good general condition after one month's illness; the presence of bile pigment in the urine. With a complete obliteration of the bile ducts the patient would have become progressively worse and would not have shown the intermittent periods in which a small amount of bile reached the intestine. The same could be said against a new growth pressing from without. Simple catarrhal jaundice was exceedingly rare at this age. However, the case probably belonged in this group, the obstructive jaundice being caused by a catarrhal inflammation of the bile ducts of infectious origin.

A CASE OF STATUS LYMPHATICUS.

Dr. G. R. Satterlee presented this case. (See page 689.)

Dr. Bell recalled the case of a baby who had been in his service in the Englewood Hospital a few weeks previously. The child came in with pneumonia and finally developed inspiratory stridor and mediastinal dullness. He thought he felt the thymus. After several weeks swelling was noted between the scapulæ. This was opened and a quantity of pus evacuated, which, upon bacteriologic examination, was found to contain pneumococci and no other organism. The child was at once relieved of the stridor, and the mass thought to be the thymus disappeared. This was evidently an encysted mediastinal empyema or a mediastinal abscess, which gave many of the symptoms and physical signs of status lymphaticus. The child made an uneventful recovery.

Dr. Long said that the case reminded him of one he saw in White Plains—a little child with convulsions, which presented very similar conditions. The diagnosis in that case was intestinal disturbance.

Dr. W. P. Northrup said that he did not often make a diagnosis of enlarged bronchial lymph nodes, but cited a case in which there were several good reasons for the diagnosis. The child was quite as well nourished as this one and showed a distinct shadow in that region, according to three X-ray pictures. It had a decided diminution of respiration on one side, and a distinct asthma on provocation, a couple of enlarged nodes above the clavicle on the same side, and a distinct widening of the shadow in the region of the thymus or perhaps more marked lower down. The shadow showed as distinctly as the spinal column does. There was diminished respiration, bronchitis, a nagging nervous cough, and asthma. Dr. Emil Mayer examined the child with the bronchoscope, and at first thought he saw some obstruction, but at the next examination felt that he was mistaken; the bronchi and right part of the trachea, however, were very distinctly congested. If the child's head was pushed backward he stopped breathing, but if he sat up he got along very comfortably, and had a good night's sleep. He looked as well as this child when he was absolutely quiet, but on the slightest provocation he had distinct attacks of asthma, and diminished respiration on that side, and it seemed as if he would go off very easily. Sometimes he had a little temperature. It was thought to be a case of enlarged bronchial glands. Dr. Northrup said he would like to know if any mention had been made of enlarged glands in this case.

Dr. Howland said that he had been unable to examine the case carefully, but that from the pictures it would appear that the thymus was slightly enlarged. In taking X-ray pictures of children, however, when an enlarged thymus is found it does not necessarily mean a status lymphaticus, for that term is usually applied to children dying as the result of an enlarged thymus gland, or, rather, when that is the only pathologic sign present and no other apparent cause for death. This condition was more common than is usually believed. It was found as frequently in children who suffer sudden death, such as traumatism, and also in children who die of acute disease or cerebrospinal meningitis, dying in twelve or twenty-four hours. In such instances it was usually said that they die of status lymphaticus. It would seem that it might be said that the picture is found because they died so suddenly.

Hochsinger, in an article on laryngeal stridor, said that he examined 30 cases and found an enlarged thymus shadow in each; but he examined some perfectly healthy children and found an enlarged thymus in a large percentage of them also. While there was such a pathologic entity as the status lymphaticus, we should also remember that this picture of enlarged thymus was probably more frequent in children than was generally supposed.

TWO CASES OF EMPYEMA.

Dr. O. M. Schloss presented these cases. (See page 693.)

Dr. Long asked if any one else could report cases of empyema that had not been operated upon.

Dr. Northrup said that if he remembered correctly the diagnosis was old empyema, that the child had spit up the pus and that absorption and retraction had done the rest. The X-ray showed nothing, so after staying a few days in the hospital he went home. The diagnosis was empyema, and was sent to the hospital to be operated upon. X-ray and needle showed no pus and no operation was attempted.

Dr. Long said that it was interesting to know that von Pirquet test was now positive, while two months ago it was negative.

The first case was particularly interesting to him because he was brought up with the idea that such cases when operated on under a year old die, but this child gained weight from the time the incision was made, 18 ounces in fourteen days. If a baby can do as well as that he would in future revise his prognosis in empyema work.

DEMONSTRATION OF SOME CASES OF LISPING.

Dr. E. W. Scripture said that during the winter he had had the opportunity to present some cases of a form of psychoneuroses which could be termed "stuttering." Tonight he presented some cases of an entirely different disease, which might be termed "negligent speech." It was characterized by a lack of precision and correctness in using the muscles of speech, and was due to a kind of mental negligence, or laziness, or inattention. Most of the cases might also be grouped together under the term "lisping." These cases could be so readily cured by such comparatively simple methods that there was usually no need for sending most of them to a specialist. The general practitioner could effect cures by these methods in the course of the regular office treatment.

The most common form of negligent speech was that where the patient said "t" instead of "s." This boy said toap, instead of soap; tun, instead of sun, and so on. In making the s there must be a small depression along the middle of the tongue, so that a jet of air be thrown against the teeth. This boy through pure negligence pressed his tongue a trifle too hard against his palate, and stopped the channel. This made the t sound instead of the s. He did not know that he was speaking incorrectly. It was a fundamental law that we did not perceive our errors of speech unless we felt them with the tongue, and were able to make the correct sound also. To cure him, you inserted a thin stick or a probe over the middle of his tongue in the median line. Then when he tried to say toap the stick produced a narrow channel necessary for the s; he actually said soap, and heard and felt himself doing it. This he was to practice over and over again. Such a case can usually be cured in three or four lessons.

Another common form of negligent speech was shown by the child, who said tum for thumb, tin for thin, dis for this, and so on. For the sound of th the tongue had to be put so lightly against the palate that air escaped at the sides. Through negligence this boy pressed his tongue too tightly and made a t or d. To cure him you placed a stick or a probe across the front part of the tongue sidewise. You tell him to say thumb; the stick kept the tongue partly down and made him actually say it, instead of tum.

This boy in saying s produced a blast of air through his nose. This snort was distinctly heard and the s seemed to have disappeared. This was due to pure carelessness in raising the soft palate to cut off the air from the nose. A very effective method of treating him was found by placing a nasal tip to one nostril, connecting this with a rubber tube with a glass end, and holding this end in front of a candle flame. Every time he let the air through his nose the candle flame was blown. He thus saw his defect, and, as you notice, in a few minutes learned to correct it.

Some cases of lisping arose from organic defects, such as tongue-tie and high arched palate, but most of them were due to a kind of mental sluggishness.

DR. LONG said that the Section was certainly to be congratulated upon having had Dr. Scripture demonstrate this line of work so thoroughly and scientifically. Some of these cases were very distressing.

REPORT OF A CASE OF SARCOMA OF THE KIDNEY, PROBABLY CONGENITAL.

DRS. J. FINLEY BELL and D. S. D. JESSUP presented this case. (See page 685.)

REPORT OF A CASE OF SQUINT IN AN INFANT EIGHTEEN MONTHS OLD CORRECTED BY EYEGLASSES.

DR. W. H. HOLZAPFEL reported the case of an infant of eighteen months who had a strabismus of 30° in the left eye due to hypermetropia whose eyes remained straight with the proper correction of the error. (Dr. Holzapfel has elaborated his views on page 697.)

DR. SOUTHWORTH said that last summer he had seen a small boy, two and one-half years of age, who had a squint, and he had been told by ophthalmologic friends that it was of the highest importance that the child should have glasses. They said that if it was a unilateral squint the child would undergo such an amount of change in the nerve that later he would not be able to recover from it. The case was referred to one of the prominent ophthalmologists in one of the large western cities, and he told the parents to bring the child to him when it was four or five years old and he would see what he could do for it. This indicates that the position taken by the best ophthalmologists here has not yet reached to the West. It is of the highest importance that such a squint should be corrected early so that the power of the eyes may not be lessened.

Dr. Long said that he was surprised to learn that babies so young were subjected to wearing glasses, and had asked Dr. Holzapfel how the patient liked it. He replied that you could not get them off. He had then asked another physician what his experience was, and it was just the opposite. He could not make the child wear them so long as her hands were free; the mother, however, plastered them on with adhesive plaster, and after a while the child grew accustomed to them and evidently enjoyed wearing them.

While the operation for squint in a child was not particularly dangerous, still it was something that one does not like to undertake, and it was very satisfactory to know that there is some way of avoiding it. These remarks of Dr. Holzapfel's were particularly gratifying on that account. As soon as a baby began to focus, if there was any suspicion that it was going to have a squint, the defect could be entirely prevented with the use of glasses.

He then inquired of Dr. Holzapfel what proportion of cases responded satisfactorily to this treatment, and was told that satisfactory results were obtained in the vast majority of cases, though comparatively few cases were seen in infants, as the children are seldom brought to the ophthalmologist until they are from five to ten years old.

Dr. Northrup said that Dr. Southworth had brought out a very important point: the preservation of the powers of the eye. It was very important to have the defect corrected early so that there was no permanent loss of power. He would like to know how long the child had to wear the glasses.

Dr. Holzapfel replied that the eye was the first part of the body to become fully developed, and if the child was far-sighted when it was brought for treatment it remained so for all time, and had to wear the glasses permanently. Squint was, in most cases, the result of hypermetropia.

Dr. Pisek inquired what arrangements the eye men had to test young children—those that could not read their letters. That difficulty had arisen in his work, and he had arranged a card with animals on it, or some such familiar objects as, for example, a shoe. From these he had test-cards made, the figures being in certain proportions corresponding with the letters on large cards and going down the scale to the smaller ones. Children who could not read letters could tell him what the object was, and in this way he had been able to determine their acuity of vision.

Dr. Bell reported 2 cases of squint in children occurring in his practice within the past eighteen months. The first case was four years old. Squint came on suddenly. Patient referred to Dr. C. S. Bull, who said it was not possible to fit glasses for a child of that age and advised local use of atropin with cleansing of the intestines and careful diet. The other child, two and one-half years old, had the condition appear during an attack of rather mild whooping-cough. The squint was not continuous, but would be present for a few hours and then disappear. After the whooping-cough subsided the condition recurred much less frequently and less marked.

Dr. Holzapfel said that Dr. Pisek had spoken of not being able to measure the children on account of their not knowing the letters. When measuring for glasses the ophthalmologists do not ask the patient to read the letters, but do the measuring themselves.

REPORT OF A CASE OF PNEUMOCOCCUS MENINGITIS IN AN UNUSUAL BRAIN, WITH SPECIMENS.

Dr. Godfrey R. Pisek presented this case. (Report will appear in October Archives.)

Stools of Infants.—It is, says J. Zahorsky (*Pediatrics*, December, 1908), gradually becoming recognized that the so-called curds in the stools of infants are not casein coagula, but soaps. To differentiate between these the writer employs an iodin stain. The mass of feces should be cut in half in order to expose the inner structure. Tincture of iodin is then poured on the masses in a test-tube or dish. After ten minutes it is thoroughly washed with alcohol, which almost completely decolorizes the mass composed of soaps, but has little effect on the brown-colored casein.—*American Journal of Obstetrics.*

CURRENT LITERATURE.

Abstracts in this Number by

Dr. R. S. Haynes. Dr. C. D. Martinetti.
Dr. Henry Heiman. Dr. M. C. Pease, Jr.
Dr. Alfred F. Hess. Drs. Pease and Pisek.
Dr. S. W. Thurber.

DISEASES OF THE EYE.

Carhart, W. M.: Hygiene of the Eye in School Children. (*American Journal of Obstetrics and Diseases of Women and Children,* July, 1908, p. 147.)

Every child whose eyes are normal is born far-sighted. At ten years a child may begin to do a great deal of work with the eyes safely. Astigmatism is largely acquired from eye-strain in the early years, when the eyes are still in an unformed and plastic state.

The ambitious child is in more danger of harming its eyes than is the sluggish child, and the child who suffers from subsequent eye disease is often the child who, with fairly normal eyes, uses them to excess, rather than the child with markedly defective eyesight. Wherever a child is found to have constant headaches during and after school work, that child is surely harming the eyes by its efforts to study. Myopic children do not often suffer from headache, but excessive application is quite as harmful in that it is apt to increase the myopia.

School statistics show that the percentage of myopia and astigmatism increases from year to year as the child advances from lower to upper grades.

"Inability to concentrate the mental attention and deficient powers of observation are often caused by bad visual memory resulting from eyestrain. The symptoms and physical signs of eyestrain in children can be easily recognized, and there is no more brilliant success in medicine than follows the correction in children of refractive error. Ocular hygiene is all important in preventing educational overstrain." M. C. Pease, Jr.

DISEASES OF EAR, NOSE AND THROAT.

Kenefick, Joseph A.: Ear Disease in Infancy and Childhood. (*American Journal of Obstetrics and Diseases of Women and Children,* April, 1908, p. 533.)

Dr. Kenefick urges that if we would preserve the "hearing function in the adult we must begin with the infant"; and he deplores the fact that a wider working knowledge of the various forms of ear diseases is not in the possession of all practitioners, no matter what their special field of work, as this ignorance hinders the spread of knowledge.

Nearly the whole of the prophylaxis of otology lies in an acquaintance of the close relation between the nose, nasopharynx and middle ear. Acute and chronic otitis, following the exanthemata or occurring independently, might be almost entirely avoided if only there was an early removal of adenoid tissue—even small amounts if in the fossa of Rosenmüller—and of diseased and hypertrophied tonsils.

Finally Dr. Kenefick concludes that mastoiditis might be a rare disease in children if only the drum was split posteriorly as soon as the diagnosis of acute otitis was made, and, like any other abscess, allowed to drain from its lowest point.

M. C. PEASE, JR.

BECK, JOSEPH C.: SOME POINTS IN ANATOMY, PATHOLOGY AND SURGICAL TREATMENT OF THE FAUCIAL TONSIL. (*Annals of Otology, Rhinology and Laryngology,* March, 1909, p. 38.)

This paper is based on the author's experience of the last four years. The landmarks about the tonsil are as follows:—

(1) Margo supratonsillaris, which is that curtain of mucous membrane which covers the upper pole of the tonsil as seen when the tonsil is pulled upon.

(3) Plica tonsillaris, a deflection of mucous membrane over the lower pole of the tonsil and which tends to hold it up as in a sling.

(3) Anterior pillar.

(4) Posterior pillar.

(5) Retrotonsillar tissue, facia and pharyngeal muscles.

The upper or vilar lobe of the tonsil is often the largest and is comparatively free and can be easily separated by blunt dissection. Bleeding is most frequently encountered in the lower pole of the tonsil. Many crypts run down to the capsule of the tonsil. Some communicate, but it is hard to make this out except by injection before the tonsil is removed. The capsule is often thickened in cases that give a history of repeated inflammations, quinsies, etc. The pathology is studied under the heads Chronic Lacunar Inflammations, Hyperplastic Tonsils, Hyperkeratosis (Leptothrix), Tuberculosis, Syphilis, Actinomycosis, Adenocarcinoma, Sarcoma and Endothelioma.

Under surgical treatment three procedures are considered: (1) Tonsillotomy by guillotine; (2) partial tonsillectomy; (3) radical enucleation. Tonsillotomy should be performed only for obstruction, as seen in the hyperplastic tonsil of children, which has not been the seat of repeated inflammations. Partial tonsillectomy is performed with snare, scissors, punch or tonsillotome. A permanent cure should not be promised in either of the above procedures. That is left to the radical operation. The chronically diseased tonsil is considered as a malignant growth in that it causes septic absorption; the whole gland must be removed, with its capsule, in order to effect a cure of the original trouble.

In children it is best to employ a general anesthetic, but in adults the operation is best done under the local injection of cocain. There is apt to be considerable bleeding and after-soreness. For the technical description of the operation see original article. S. W. THURBER.

HURD, LEE M.: THE CLINICAL DIAGNOSIS OF TUBERCULOSIS OF THE TONSILS.

WRIGHT, JONATHAN: WITH SOME REMARKS UPON THE MICROSCOPIC DIAGNOSIS. (*Annals of Otology, Rhinology and Laryngology,* June, 1909, p. 375.)

Enlargement of cervical glands is always an evidence of disease in the corresponding tonsil. The glandular enlargement is due to septic absorption or to the absorption of tubercle bacilli. The author believes that the enlargement starts from septic absorption after tonsillar resistance has been weakened by disease, and as a consequence the tubercle bacillus gains an easy foothold into the cervical glands, not always leaving evidence of its passing through the tonsil. The author divides the faucial tonsil into two classes: (1) Those that are enlarged, somewhat pedunculated and most of it hanging free in the fauces, and (2) those more or less buried beneath the faucial pillars. The first class cause the least systemic harm and are the common ones in children. The second class are subject to acute and chronic inflammations, and are more often associated with glandular enlargement. Children with this variety are apt to be anemic and languid, and these tonsils are the proper soil for the invasion by tubercle bacilli in themselves and through them to the cervical lymphatics.

The tuberculous tonsil is usually pale, crypts contain cheesy matter, the edges of the anterior pillar may have a passive hyperemia and the associated cervical gland is large and hard.

If tuberculosis has reached the gland it is still good surgery to remove the tonsil for two reasons: (1) Such a tonsil is allowing entrance of germs, and (2) the lymphatics can overcome the tuberculous invasion with the tonsil out more readily than if it is left *in situ*. This is shown by the fact that, after the removal of the tonsil, the glands begin to subside. The total enucleation of the tonsil is the only operation to perform in these cases.

A table of 12 cases is appended showing 6 cases in children where 5 had tuberculous tonsils associated with cervical adenitis, and in all these the tonsils were of the buried type.

Also another table of 13 cases (12 of them children) in which there was buried tonsils with soft cervical glandular enlargement and in which a diagnosis of chronic inflammation was made with but one tuberculous.

The remarks by Dr. Wright should be read in their entirety.

S. W. THURBER.

PATHOLOGY.

ROSENSTERN, J.: EXUDATIVE DIATHESIS AND EOSINOPHILIA. (*Jahrb. für Kinderhk.*, June 21, 1909, p. 631.)

Twelve of 14 cases of infantile eczema showed a pronounced eosinophilia, and 3 of 6 cases of asthma gave a similar blood change. The 3 positive cases suffered from pure bronchial asthma. The asthma in 2 of the 3 negative cases was probably due to pressure on the bronchi, vagus and recurrent nerve by enlarged tuberculous nodes.

The blood in 5 cases of prurigo was also examined, and 3 of these showed a marked eosinophilia. Eosinophilia was found in 4 out of 8 infants that suffered from chronic intestinal dyspepsia. Two of these infants later developed other symptoms of the exudative diathesis. The 4 negative cases showed no further symptoms.

The eosinophilia present in eczema is not dependent on the local skin condition, as it often persists even after the eczema is cured. The eczema and eosinophilia are probably coördinate symptoms of a constitutional anomaly.

HENRY HEIMAN.

ESCHERICH, THEODOR: WHAT DO WE MEAN BY SCROFULA? (*Wien. Klin. Woch.*, 1909, No. 7.)

Before any scrofulous manifestations present themselves the condition of status lymphaticus obtains. This persists throughout the disease. As the result of infection by the tubercle bacillus a circumscribed focus of disease, one generally not recognized, is added to the constitutional anomaly. This causes an allergic state or supersensitiveness of the skin, more especially for the tuberculo-toxin, so that the minutest quantity of the poison leads to the cutaneous and catarrhal changes, which are diagnostic of a scrofulous condition. Later, due to infection of the blood or lymph channels, metastatic foci, or even generalized tuberculosis, may be brought about. Escherich insists, however, that the well-known picture of scrofula is seen only when the primary lymphatic constitution forms a soil for its development.

ALFRED F. HESS.

ENGEL: GASTRIC SECRETION IN ITS RELATION TO THE PATHOGENESIS AND COURSE OF THE PYLORIC STENOSIS OF INFANTS. (*Deutsch. Med. Woch.*, No. 29, 1909, p. 1,271.)

Engel believes that a marked increase in the secretion of the gastric juice is characteristic in the early stage of pyloric stenosis. Coincident with this hypersecretion there occurs a spastic closure of the pylorus, perhaps due to the gastric juice, perhaps brought about by one and the same cause. Following this acute stage of secretory disturbance there remains a chronic stenosis of the pylorus, which gradually yields, but gives rise to obstructive symptoms while it lasts. The author's conclusions are based upon some well-studied cases in which a gastric succorrhea was demonstrated.

ALFRED F. HESS.

MEDICINE.

BAGINSKY, ADOLPH VON: NEURASTHENIC AND NERVOUS CHILDREN. (*Die Therapie der Gegenwart,* April and May, 1909.)

Baginsky says that neurasthenia is a diagnosis often made in children, but it is rarely justified and should only be made after a careful study and observation of the history and environment of the child. The so-called "capricious child" usually becomes a capricious mother. It is always to be borne in mind that a child is quite as apt to imitate bad habits and lax morals as it is to imitate the good qualities of its parents. It is an undoubted fact that neurasthenia in a growing child can in the highest degree be influenced by environment.

A definition of neurasthenia is impossible. The variations from the normal, which cause a diagnosis of "nervous child" to be made, are so numerous that only a very broad definition can include all the conditions which are brought together under the heading "neurasthenia," also the various causes bringing about a condition of somatic and psychic pathologic phenomena are numerous.

The use of alcohol by nursing mothers may cause many nervous disturbances, not so much because the alcohol actually reaches the child, but rather from the fact that beer, wine, etc., often bring about a condition of dyspepsia; and either from this cause or from causes related to this action set up severe nervous disturbances. It certainly must be granted that unfit nourishment, faulty overfeeding, and the introduction of stimulants of all kinds to the nervous system of young children may set up a condition of irritation.

Faulty pedagogic training, bad habits and want of control of the temper begin to show their evil influence in earliest infancy. By spoiling and foolishly yielding to the child there very early arises an irritability of the nervous system that terminates in anomalous psychic and nervous phenomena.

A most important etiologic factor in the nervous history of children is sickness, as the acute infectious diseases and acute febrile diseases.

There are many symptoms of neurasthenia in children, a careful consideration of which will lead to a diagnosis. Perhaps the most important is timidity. A characteristic sign of neurasthenia is loss of sleep. Crying and loss of sleep may be the forerunners of tetanic or spasmodic seizures, and in many cases nervous symptoms are due to toxemic irritants.

As these children grow older they become more and more impressionable. There are abnormal reactions both in the psychic and motor spheres. In the severer forms variations in the reactions appear. The behavior and demeanor of the child either becomes extravagant or strange, and in most cases there is a combination of extravagance and strangeness. Finally the condition of hysteria is reached and the transition from the one condition to the other is not sharply defined.

There is irritability, changes of mood, forgetfulness, conditions all of which render attendance at school difficult and hinder progress in instruction. Sleeplessness or, at least, irregular sleep, unseasonable hours or excessive drowsiness are troublesome. The appetite is poor, and there is a desire for strange, unfamiliar piquant foods. Regurgitation and vomiting, alternating with diarrhea and constipation, frequently occur. Difficult breathing and pain on respiration may be complained of also, and comparatively rarely, palpitation of the heart. Pains in the muscles and joints may have a truly nervous origin, and must be distinguished from the "growing pain" or rheumatic pains. There may be great difficulty in the diagnosis, which must depend upon the sudden onset, the spontaneous disappearance and the return of the pain, with the entire absence of any inflammatory signs. The motor symptoms are most noticeable and striking. There are strange symptoms of the highest significance; trembling movements, jerking of the head, the back and the extremities—now occurring in paroxysms, and now lasting for a time. Finally, in this group are the tics, those jerks and sudden unexpected movements which are seemingly compulsive and which cannot be inhibited. The tic type is common, and is differentiated from the true tics by the fact that in the latter type there is an especial morbid determinable fixed movement; it may be only a grimace or a movement of the back muscles, disclosing itself in an increasing and explosive contraction after a period of rest. This is not the case in the tics of nervous children; here the movement does not change as in chorea. Occasionally the child assumes toxic or cataleptic-like positions of the limbs, which, however, are transient; the child assumes suddenly a strange and unexpected position for a moment, then after a time these positions disappear, to give way to choreic tic-like movements.

Alterations in the psychic world of the nervous child are of the utmost significance. They become inattentive, dreamy and absent-minded. In some cases there is a strange perversity, and failures and mistakes are made which it is difficult to explain. They refuse to get up in the morning, to eat, or to play; they are destructive and slovenly, but when they are away from home they are frequently the most obedient, amiable, bright and noticeably model children. There may be disorders of speech, such as stuttering, drawling, etc. Sadness, distress, melancholy and anxiety may all be prominent, and may lead to anything from refusal to put on a new dress for fear of soiling it to those fearful occurrences, those outbreaks of anger which lead to murder or suicide.

Treatment.—No single method is effective, as each case differs from all others, not only etiologically, but also in symptoms, and consequently each case will demand individual treatment. Disturbed nutrition, a condition of chronic anemia, the history of a previous illness, the presence of a tuberculous condition, hypertrophied tonsils and adenoids, and a hundred other injurious conditions can be removed and eventually cured more or less easily. Remove the nervous child as far as possible from its environment. Take it away from school, from the family and from work, and place it in a quiet country place, for the woods and the garden are powerful influences in the healing of these cases. Rest in bed is sometimes attended with the best results. In general, these children should not be taken to the sea, though some children do well there, as it is not a factor in treating nervous children, at least not before a certain grade of peacefulness has been reached. The roar of the surf, the light reflex of the sea, the strong currents of air are not conducive to the equilibrium of irritated nerves. Most important measures are rest at the place of abode, uniformity of régimé in the distribution of time, walking, jaunts, play and activities, and a well regulated diet. The diet should be a bland one in most cases, preferably a vegetable diet, with a small amount of stimulants, such as tea, coffee and spices. In some cases there should be forced nourishment, consisting of red meat foods, etc. A simple milk diet is not to be recommended, as it is too onesided. The glycero-phosphates, the albumin preparations, the arsenic-albumin preparations, etc., may be used cautiously. Baths often do more harm than good, and especial care should be used in giving salt baths, carbonic baths and electrical baths. They should be avoided if it is noticed that they are followed by excitement or lassitude; cold baths, cold rubs, and friction are often beneficial and in anemic cases do great good. Where there is loss of sleep seek first of all for obstruction in the air passages or trouble in the ears. If an operation is necessary, avoid frightening the child, and attempt to make it understand what it is necessary to do. As a general thing children do not need narcotics; nevertheless, it is not necessary to entirely avoid their use, and such drugs as veronal, bromid or bromid preparations can be given if sleep and rest are not to be obtained otherwise.

Ne quid nimis must be the watchword where the therapy of neurasthenic and neuropathic children is concerned. The keynote of all skillful treatment must be, and must remain, "Love for the sick children," coupled with earnest, fatherly instruction, and, last but not least, put into the balance "patience."

PEASE AND PISEK.

MEAKIN, J. C.: RHEUMATISM. (*The Canadian Journal of Medicine and Surgery,* February, 1909, p. 71.)

Dr. Meakin, after a detailed description of many animal experiments, arrives at the following fairly-well proven conclusions: (1) Acute rheumatic fever is a streptococcus infection. (2) It is a streptococcemia at some stage and not a local disease. (3) The streptococcus producing acute rheumatic fever is indistinguishable morphologically, culturally and biologically from other streptococci. (4) The tonsil is probably the main point of entry of the streptococcus in acute rheumatic fever.

M. C. PEASE, JR.

KERR, LE GRAND: CHYLOUS ASCITES IN AN INFANT SIXTEEN DAYS OLD. (*New York State Journal of Medicine,* January, 1909, p. 14.)

Dr. Kerr reports probably the youngest case on record of chylous ascites in childhood. There was fluid in the abdomen, which was withdrawn by paracentesis. The report on this fluid was as follows: "Findings, milky white fluid, odorless, specific gravity 1,013. Reaction alkaline faintly. Shaken up with ether and filtered, a slightly opaque filtrate is obtained. Microscopic examination reveals a profusion of fat cells, a few cholesterin crystals and a few colored blood corpuscles. The fluid has all the characteristics of chyle."

This child exhibited symptoms of syphilis, and improved when antisyphilitic treatment was instituted. Undoubtedly there was some specific cause for the abdominal condition.

M. C. PEASE, JR.

WILLIAMS, LEONARD: ADENOIDS, NOCTURNAL INCONTINENCE AND THE THYROID GLAND. (*Lancet,* May 1, 1909.)

Williams was led to the use of thyroid gland in incontinence by noting aggravation of the incontinence after removal of adenoids from a child in whom they were supposed to be the cause of the enuresis. The argument was that the adenoid hypertrophy was in all probability compensatory for a deficiency of lymphatic substance elsewhere. The thyroid gland having very intimate relations with lymphatic tissue was chosen in the attempt to supply the supposedly deficient internal secretion. Twenty-five cases are reported in all but one of which the results were good and, in some instances, brilliant. In the case which did poorly the conclusion was drawn from the reaction in another case, that too much thyroid was responsible for the lack of improvement. The author concludes that adenoids are not the cause of enuresis, and that probably both adenoid hypertrophy and enuresis are dependent upon an insufficiency of the internal secretion of the thyroid gland. R. S. HAYNES.

HELLESEN, E.: THE CUTANEOUS TUBERCULIN REACTION IN CHILDHOOD. (*Jahrb. für Kinderhk.,* June 12, 1909, p. 665.)

Four hundred and eighteen children of various ages were submitted to this test in the out- and indoor departments of the Universitats Kinderklinik of Christiania. Pure and 25 per cent. solutions of tuberculin were used. The more marked reactions were present in the more robust children. The reaction was more marked in children suffering from scrofula and bone tuberculosis than those affected with pulmonary tuberculosis. Secondary and torpid reactions were seen only a few times. The reaction was entirely harmless.

The cases were divided into three groups: (1) Cases of clinical tuberculosis. (2) Cases of suspected tuberculosis. (3) Cases with no clinical tuberculosis. There were 58 children in the first group. Fifty-six (97 per cent.) of these gave a positive reaction. The 2 negative cases suffered from an advanced stage of tuberculous meningitis. The second group included 95 children, and of these 59 gave a positive reaction. In this group there were 13 cases of pleurisy with effusion, of whom 12 reacted positively. A positive reaction was present in 7 cases of enlarged bronchial glands. The third group included 301 children, and of these 23 per cent. gave a positive reaction. In the first year, 2 per cent. reacted positively, while there were 46 per cent. positive reactions in the children from ten to fourteen years.

Autopsies were performed on 11 children, 4 of whom gave a positive and 7 a negative reaction. The autopsy findings corresponded with the results of the von Pirquet test, with the exception of 1 positive case. In this child the autopsy revealed the presence of pneumonic consolidation, numerous small pulmonary abscesses, and enlarged glands in the cervical, tracheal and hilus regions. No signs of tuberculosis were found either macroscopically or microscopically. Animal inoculations, however, could not be made.

From this study the author concludes that the reaction is specific in nature and is of very great value in the diagnosis of tuberculosis in infancy. A positive reaction shows the presence of tuberculosis, but is no indication of the severity or activity of the process. A negative reaction practically excludes the presence of active tuberculosis, except that which is generalized or at an advanced stage. HENRY HEIMAN.

HASSE, C.: ICTERUS NEONATORUM. (*Jahrb. für Kinderhk.*, June 12, 1909, p. 625.)

Careful anatomic studies of the abdominal organs of fetuses and newborn babies lead the author to formulate a somewhat new theory as regards the pathogenesis of icterus neonatorum. Hasse thinks that this type of icterus is due to the stasis in the bile ducts and is directly influenced by the action of the diaphragm during respiration. The descent of the diaphragm with inspiration increases the already high pressure in the bile ducts and portal vein. The escape of bile into the intestine is thus hindered, stasis occurs and is followed by absorption of bile into the blood. This increased pressure and stasis disappears shortly as a result of the physiologic diminution in the size of the liver and a rearrangement of the hepatic lobes and duodenum, permitting a free escape of bile into the intestine. HENRY HEIMAN.

BRUCE, HERBERT A.: STATUS LYMPHATICUS AS A CAUSE OF DEATH UNDER ANESTHESIA. (*The Canada Lancet*, July, 1909, p. 818.)

In this article there will be found a most instructive résumé of the history of status lymphaticus as a cause of sudden death, with a discussion of its pathology, frequency and diagnosis. The author concludes that in view of the large proportion of cases in which death has occurred during or after the administration of chloroform it is evident that ether should be chosen even for the youngest patients, and especially for minor operations—given by the open method. M. C. PEASE, JR.

VENTURA, C.: A CASE OF INFANTILE SPLENIC ANEMIA. (*Gazzetta degli Ospedali*, No. 30, 1909.)

Ventura reports the case of a girl two months old who was affected with splenic anemia apparently following a septicemic infection of the navel. No other cause could possibly have brought this to pass, as was proved by autopsy. While it is impossible to draw conclusions from a single case, this may be regarded as a contribution to the etiology of infantile splenic anemia. C. D. MARTINETTI.

THERAPEUTICS.

SCHLOSSMAN, A.: ON THE THERAPEUTIC USE OF TUBERCULIN IN THE TUBERCULOSIS OF INFANCY AND CHILDHOOD. (*Deutsch. Med. Woch.*, No. 7, 1909.)

Schlossman reports remarkably good results from large doses of tuberculin. In the cases of 9 infants there was general improvement under this treatment. The benefit in the bone and joint cases could be followed by means of the X-ray. As the result of these favorable results Schlossman regards tuberculosis in infancy in a new light; although he considers the prognosis in general unfavorable, yet in cases which are well fed and properly treated with tuberculin he believes the prognosis good, and the chances favorable of bringing them through the first year of life. Although large doses of tuberculin are used, great care is exercised in beginning the treatment, in general $^1/_{100}$ mg being used, and this dose not increased as long as it produces a reaction. Then rapid increases are made and as large doses are injected as the child can stand without showing a violent reaction. Schlossman admits that there is some danger connected with this treatment, especially in its early stages. However, as these children would die without specific treatment, these failures form no contraindication for its general application. ALFRED F. HESS.

BOOK REVIEWS.

Short Talks with Young Mothers on the Management of Infants and Young Children. By Charles Gilmore Kerley, M.D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital; Attending Physician to the New York Infant Asylum; Assistant Attending Physician to the Babies' Hospital, New York. Second edition, revised and enlarged. Illustrated. Pp. 327. New York and London: G. P. Putnam's Sons, The Knickerbocker Press, 1909.

This little book is issued in a somewhat more convenient form than in its first edition. It has proved to be one of the best of this class of books which aim to help educate the modern mother and to serve to advise her in the doctor's absence or before he can be summoned. While it is always a moot question of how much value it is to publish a list of formulas for feeding children during the course of the first year, which mothers can use without consulting a physician, this book shares the fault, if any, with nearly all books of the sort. As a substitute for the promiscuous advice of neighbors who have raised families of six or more children, Dr. Kerley's common-sense talks must surely work benefit to a large number of the coming generation.

BOOKS RECEIVED.

Human Physiology: An Elementary Text Book of Anatomy, Physiology and Hygiene. By John W. Ritchie, Professor of Biology, College of William and Mary, Virginia. Pp. 362. Illustrated. Yonkers-on-Hudson, N. Y.: World Book Co., 1909.

De l'Illusion, son Mécanisme Psycho-Social. Par le Prestidigitateur Alber, avec une préface de Raymond Meunier. Pp. 118. Paris: Bloud et Cie., 1909.

Rééducation Physique et Psychique. Par le Dr. H. Lavrand, Professeur aux Facultés Libres de Lille. Pp. 121. Paris: Bloud et Cie., 1909.

ARCHIVES OF PEDIATRICS

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ORIGINAL COMMUNICATIONS.

THE POSITION AND WORK OF THE AMERICAN PEDIATRIC SOCIETY TOWARD PUBLIC QUESTIONS.*

BY THOMAS MORGAN ROTCH, M.D.,
Boston.

At a meeting held for the discussion of the child labor question, under the auspices of Miss Gurnee at the Colony Club in New York, on January 4, 1909, a number of representative members of the Pediatric Society were present. Through the endorsement which they gave to my views I have been encouraged to bring the relation which our Society should, in my opinion, take on public questions in general before you as a whole.

The audience at the New York meeting included a number of different interests, each working for the supposed welfare of the children of our country, but each determining its course of action from its own particular point of view, the point of view being regulated by the especial work which the especial interest was engaged in.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 27, 1909.

A month later, in February, I again addressed a large and still more representative audience in the Auditorium in Chicago. At that meeting I learned from representative individuals connected with the most diverse interests what a heterogeneous mass of unclassified and unadjusted ideas and opinions, not only we physicians are confronted with in approaching the question of the safeguarding of early life, but how the same difficulties baffle the legal profession both in correcting bad laws and in enforcing good ones.

In both New York and Chicago I tried to impress upon educators and philanthropists that no one set of workers could know all sides of the problems connected with early life and that the intelligent solution of these problems could only be accomplished by making use of the combined knowledge of each student in his own particular province of research. I explained to them that what many of these questions needed for practical consideration was not merely the general knowledge of children possessed by the rank and file of the medical practitioners, even though as individuals they might be eminent in some other branch of medicine than Pediatrics.

I tried to make them understand that the mature knowledge derived from a special study of years in connection with early life was required practically in the solution of these problems. I told them that our Pediatric Society provided such a body of men whose knowledge ought to be utilized if they expected to deal with these problems intelligently, and not by their ignorance of the vital principles connected with childhood defeat their own good intentions and their own excellent philanthropic work.

The Chicago meeting was essentially a Child Labor Convention, and the whole force of the Child Labor Committee was centered on influencing Congress to carry out the reforms considered necessary by the Child Labor philanthropists to ameliorate the undoubted wrongs which the young people of our country are enduring.

Through the endeavors of the Child Labor Movement a bureau for children has been established as a part of the Department of the Interior, and it is to this bureau that in the future we must turn to bring about the reforms which are so much needed all over the country.

The large body of women who are connected with the Child Labor Movement has added greatly to the accomplishment of markedly successful results, and too much praise cannot be given to the whole number of both men and women who now for some years have labored unceasingly.

We physicians, however, whose mission it really is to guide the progress of the various reforms connected with early life and see that they do not go astray, should interest ourselves in curbing exaggerated ideas and in the prevention of unwisely pressing upon our legislators unsound views on which to base new laws.

For instance, one of the main objects for which the Child Labor Committee has been striving is to obtain a law throughout the country which shall increase the age in years required before a child shall labor, notably in the mills. Not only would such a law, if it could be obtained (which it never can be), be practically unwise and essentially wrong, but it would, according to our knowledge of young human beings, probably do harm in many ways.

It is well known that children vary in their development, not only in different parts of our country, but that this variation occurs in different races and notably in different families of the same race.

To pass a universal law, therefore, that demands fourteen years of life before a child can work, inevitably means that children in one part of the country or of an especial race or parentage will be made to work too soon or in many cases not soon enough.

It is true that the age-law for labor in many of our states is undoubtedly too low, as for instance that of ten years in South Carolina, but for that reason only we should not insist on a law of fifteen or sixteen years which in some states and in some classes would be unwise and unpractical. When through the efforts of the Child Labor enthusiasts the age limit in the District of Columbia was increased from twelve to fourteen years a significant result followed. Strong, well-developed negro boys, twelve and thirteen years of age, who had been working without harm to themselves or to anyone else, were cut off from their work and became loafers on the streets. The corollary to this, however, was experienced in numbers of boys of fourteen who although from their general lack of development were unfitted for many different kinds of work, yet were employed under the new law to do work which they were manifestly unfitted to do.

To cut off the cotton pickers in the South from doing the work which they are best fitted for, because they are not fourteen or fifteen years of age, would be manifestly unwise, and, in fact, knowing the predisposition to tuberculosis which exists among this class, we should deprive them of the very out-door work which is best for them.

On the same principle the grading of young children in athletic contests, in kindergartens and in schools according to the number of years since they have been born is manifestly wrong. Chronologic age varies to such a degree that groups of individual children of the same chronologic age present many radically different degrees of strength for labor; for resisting the different strains brought to bear on their physical and mental development in the different grades of kindergarten and school and in the various physical contests which naturally come into their school life. The present state of the efforts at reform among philanthropists, Child Labor enthusiasts, educators, and those who are interested in athletic sports is somewhat chaotic. What is needed to organize the real power of the people for good in all these philanthropic endeavors is to persuade these different classes of workers to listen to what we can tell them of the actual facts which govern the true solution of the child problem, facts which are best known and enunciated by those who have made this problem their life work.

I was much pleased with the message which came to me from certain legislators in Washington where I was about to read a paper on the developmental questions of childhood, that what Congress needed when the question of Child Labor was vigorously and insistently pushed upon it by the National Child Labor Committee, was to hear from the medical profession the actual facts as to the ability of children to do without harm certain kinds of work. They impressed upon me that enthusiastic philanthropists were often unsafe advisers and advocates. They also advised me personally not to identify myself too closely with any one group of philanthropists but to simply state practical scientific facts.

The power to work physically and the degree of resisting power needed in kindergartens, schools and athletics cannot be estimated by years and therefore rules and laws attempting to so classify are illusive and wrong. Beyond this, however, even if chronologic laws had been proved to be good, they would fail to accomplish the desired results by the impossibility of carrying them out.

The lawyers acknowledge that they are practically helpless in their endeavor to enforce these laws because they are so easily evaded. The judges, especially of the juvenile criminal courts, tell me that a remarkable degree of perjury as to age exists in the courts. Thousands of false returns of age are given, false birth certificates are exceedingly common, and over and over again no birth certificates can be found.

In some states, again, illegitimate births are purposely not recorded. The consequence is that although the law of an especial state says that no child under fourteen years of age shall work in a mill, the mills are full of children only twelve or thirteen years of age. This happens not because the mill owners allow these children to enter their employ, for they actually employ physicians to try to tell them how old the children are in order to obey the law. The trouble comes from the children's parents or guardians, who swear that their child's age conforms to the especial law of the state in which it lives.

In addition to this it is now well known that height, weight, and the eruption of the teeth are exceedingly delusive. A child of eleven may look, so far as height and weight are concerned, as though he were twelve or twelve and a half years of age, or again as though he were ten or nine and a half years of age. Careful investigations have shown, in fact, that height may vary by a year and a half and that weight is equally illusive.

The one great principle, which I suppose we all as pediatricians will accede to, is that a child should be entered and graded in kindergarten when his physical development shows that he has sufficient resisting power to normally cope with whatever strains, whether mental or physical, he has to encounter in those grades.

In like manner that when without mental or physical fatigue he can carry out the curriculum in certain grades in school he should be placed in those grades. Again that an exact examination of his physical development should be made, no matter what his chronologic age, before he be allowed to contest in athletics, and then only after he has been grouped with an equal stage of development and not chronologically.

Finally that as physicians we should so study the different degrees of force-outcome needed for different employments as to gauge the degree of physical development required for that employment.

With a physical developmental index we can well dismiss laws for chronologic age and in this way also not be led astray by idiosyncrasy of race, family or individual. Each child by this method can be judged by its individual development and placed, whether in school, athletics, or work, where it belongs physically, and where it can live its early life in competition with other individuals, whose development being the same will give opportunity for normal unstrained growth.

It is worthy of note that Professor Pryor, of the University of Kentucky, has already shown that there exists a decided difference in the physical development of the osseous centers of males and of females; the latter being decidedly in advance of the former even from birth. This again gives us a reason for discarding chronologic age as an index for classification but still enunciates the fact that although girls develop early and as we know become mature some years sooner than do boys, yet that we should determine their lives by their individual development.

Following this rule in some cases girls should be classified sometimes with boys who are older, or again with boys who are younger or of an equal age. The entire question depends on whether they show equal, less, or greater development.

If you take into consideration what I have said really means, you will, I am sure, agree with me that the determination of degrees of development to correspond with the many different conditions and requirements of child life belongs to a body of physicians, trained for this especial work and not to the laity. The laity, however earnest and enthusiastic it may be, is in no way fitted to deal with what is really an intricate scientific study combining a knowledge of anatomy, physiology, hygiene, years of intelligent and trained observation of children in health and in disease and the continual meeting as we do in our consulting rooms with children who are suffering from unwise rules and bad laws.

It will not be an easy matter to make the philanthropic laity see and acknowledge this, but it is just as wrong and undignified for us who are supposed to regulate the health and well-being of children to stand by and to allow the ignorant though humane laity to take charge of this duty to the young, as it was for us to allow for so many years the regulation of infant feeding to remain in the hands of the proprietors of patent foods.

As I look at it, it is the province of this army of self-sacrificing, indomitable and philanthropic women and laymen-captains who are doing such a great work for humanity all over our country to attack the mills, the sweat-shops and the many criminal strongholds where children's lives are being ruined and to drag this crime into the light of day. When once, however, this work is done, they should submit to the guidance of the generals who possess the necessary knowledge for best dealing with the situation. Then when the question of where the reform is needed and the reasons for it are scientifically settled the legal profession should be consulted as to how these reforms can be carried out and how new and better laws can be framed.

The legislators should then be informed of their manifest duty to frame laws, untrammelled by the importunities of the enthusiastic laymen whose arguments and methods are too often unwittingly handicapped by sentiment. More than this is the tendency of the non-medical workers of the present age to deal with and to think that they can solve abstruse medical questions without expert advice.

In the question of athletics we shall probably be met more than half way by those who are interested in protecting our boys and girls from over physical strain. Already since stating my views on an anatomic index of development, as an aid in controlling athletic sports, at the Washington meeting, the Secretary of the Navy has sent for information on this subject, stating that he thinks it may be useful when brought to bear on the boys at the United States Naval Academy.

While it is fairly evident what the position of the Pediatric Society should be in regard to Child Labor and perhaps equally evident to us as pediatricians what our position should be in regard to kindergartens and to schools, yet we have here a more complex problem to deal with and we shall probably be looked upon by the educators still more askance and with still greater disbelief than by the Child Labor devotees. In my mind, however, there is no question but that a radical reform is needed in the organization, especially of the schools.

It will not be quite so difficult a task with the kindergartens as more or less dissatisfaction in regard to them has arisen among the laity themselves.

The schools present a problem in themselves; a problem made still more difficult from the fact that the recognized reformers trusted by the laity are as a rule non-medical men. It is true that the aid of physicians is called in and in certain lines is most useful, but the specialists are those connected with the eye, the ear, the throat, and the hygienist, and it is seldom that a professed pediatrician is called in council. Yet the professional laboratories (the consulting rooms of the pediatricians), are where the most knowledge concerning unwise school regulations can be obtained.

The educators are too much inclined to take it for granted that they know what is best for children. They seem to be unaware that there is a still further and more advanced knowledge of the finer factors of the child educational problem beyond what they receive from the general medical practitioner or from the reading of books on school hygiene.

We pediatricians, however, know from personal observation of the many instances where evil results arise from the present supposed-to-be most enlightened organization of the schools.

It is not by any means the fault always of the school teachers. This class of the laity is long suffering, hemmed in and overborne on the one hand by unenlightened and practically blind parents, and on the other by would-be educational authorities.

The school teachers see, as do the physicians, the evil results of demanding too much of the bright, precocious brains. They know that advancing such brains to a higher grade when not upheld by a proper physical development is productive of future, and sometimes irreparable harm, and the presentation in the physicians' consulting rooms of broken down precocious anomalies.

The teacher protests, the physician reproves and advises, but the parents insist in upholding their mistaken prerogatives from false pride based upon ignorance. Only lately some prominent school teachers have expressed to me their disgust at the discussion at an educators' meeting where they went to learn. The educators in taking up the question of what studies should be taught in the various grades in the schools dwelt entirely on what they as individuals preferred to teach rather than on what studies were best suited to the especial development of the brain which was to undertake them. They overlooked entirely that the study must be adapted to the brain power rather than the brain at random to the study.

A marked and significant example of how the great schools in England, and to a somewhat less extent in this country, have for centuries overlooked the physical laws which are so evident in the young, arises in the question of sleep, and its relation to the growing brain and to the individual development. Tradition has allowed these schools for years to make little distinction between the younger boys and the older boys as regards the number of hours set aside for sleep.

The well-known physiological fact that the earlier the development the longer the sleeping period required has been and still is disregarded. One of our colleagues, Dr. Acland, of London, has sounded the alarm at this lack of a practical application of the laws of development, and it is encouraging to note that English educators have taken notice of his wise observations.

With these evident facts before us it would seem almost the duty of the American Pediatric Society to use the great, wise and efficient influence which it surely is well fitted to exert, in assisting in the work of safeguarding early life by assuming an entirely independent position in the various communities where individual influence is felt and respected.

We should make ourselves felt in the light of an advisory body, which from time to time shall bring up among the other subjects for discussion at our yearly meetings, one by one, the many important questions connected with child life. We should not, however, allow ourselves to become identified with any one set of workers. We must not only have our peculiar place in the community, but not allow ourselves to be dominated by any of the great divisions which are fighting for children's rights, whether in kindergarten, school, athletics or Child Labor.

What is still more important is that we should, if necessary, actually oppose educators and Child Labor Committees. Knowing that the law for chronologic age which I have spoken of as having lately been passed for the District of Columbia, and which was looked upon with such pride by the Child Labor Committee, is manifestly unwise and retrogressive, we should inform the legislators that we, as pediatrists, in no way subscribe to such laws.

An example of what has already happened is a personal episode which occurred last autumn. The Child Labor Committee asked me to present my paper on the anatomic index at Chicago.

They, then, while admitting that my position was sound and would be of great value in aiding their work, also said that they were afraid to have it appear in their transactions as it might interfere with the legislation which they wished to carry out. This was fortunate for me and for us as pediatricians, since if it had appeared it would have identified me with the Child Labor Committee which from my point of view would be most undesirable.

On the other hand I have lately, after spending an hour in explaining the value of an anatomic index to one of the most advanced educators in this country and a member of the National Child Labor Committee, had the opinion expressed by him that if such an index were reliable it would be of inestimable value to the work on Child Labor and would at once settle questions for the committee which have seemed almost insurmountable.

I have already published some work which I have been engaged in for the last four years, and which will, I hope, aid in the establishment of better laws for children.

The principle involved is that we should find some ready means for deciding in every phase of a child's life whether the child is ready physically to enter upon some new and progressive tax on its mental and physical condition. I believe that such a principle can be sustained by the use of the Roentgen ray as applied to the bones with far greater accuracy than by any other method which up to the present time has been employed.

The various other means in the light of modern investigations are, as I have said, unreliable. Crampton's fine work on the correlation of height and weight with chronologic age shows that such correlation when taken at random may vary as much as a year and a half. His physiologic work in connection with the latter part of childhood is valuable, but is not practical in its application. There is, however, a strong correlation in height, weight and chronologic age when we take them in comparison with groups of an equal development.

This means that an index founded on an anatomic basis is what we should turn to in our endeavor to begin the work of rehabilitation of the rules and the laws for early life. We must first recognize that age does not practically mean only years and months; on the contrary, it means the different stages of use and growth of the functions of early life shown in physiologic laws, and again in the normal progressive development in the growth of the ossific centers. We should, therefore, speak of chronologic age, physiologic age and anatomic age. Each has its place in determining the grading of young human beings from birth to adolescence, and indeed to that period when the ossification of the epiphyses is completed.

The bones represent the steel framework on which rests the building, gives it its real strength, and portrays what its strength can be. The epiphyses are the chief factors in this framework and the keystones of its completed development. They are not only the centers which denote the phases of life, both mental and physical, and show as landmarks when the time has come for more extended use, but they are well known to be important nidi where disease enters and from which it may be carried elsewhere.

This assuming the anatomic development, however, to be of primary importance as an index of development and as a guide for the grading of early life does not mean that we should not also make use of the other evidences of anatomic and physiologic growth as evidence of health, just as the roofing and completion of the building is a large part of representing a good building.

A normal condition means healthy organs and muscles as well as a normal osseous system, and where there is evidence that these former are abnormal we must use such evidence in deciding what rule to follow in a special case. On the other hand, while the muscular system when weak can, as a rule, be strengthened and while a diseased organ can be detected and thus stamp the individual as abnormal, it is in the epiphyses that we look for the groundwork of strength and for the real evidence of normal development. The bones, however, when normal, should show such normality in their quality as well as in their size, and a study of such quality should be made to supplement other evidence of their strength.

It would be out of place here to describe the laborious details of the work which had to be gone through with in order to arrive at what seem to me to be anatomically correct data.

The information which has been obtained of living anatomy, especially of the epiphyses, since the Roentgen method has been employed in investigation, is altering our previous supposed anatomic knowledge to a surprising degree.

Some of the views of anatomists are, through this supplanting of dissections of the dead by actual pictures of the living, being proved to be wrong. It is, therefore, important to obtain, if we can, the opinion and knowledge of those scientists who are fitted both as anatomists and Roentgenologists to criticise such work as I am presenting to you.

Fortunately for me such a scientist has presented himself in the last year and has been supplying me with fresh facts and with expert encouragement. Unknown to me as I was to him, Dr. J. W. Pryor, Professor of Anatomy and Physiology of the State University of Kentucky, and evidently a skilled Roentgenologist, has been carrying on an expert investigation of the development of the joints in exactly the same way as I had been doing. Professor Pryor writes me that he absolutely endorses my work and my views, that he believes that the principle of an anatomic index which I have endorsed is correct and that I am right in saying that in the vast majority of cases the normal and abnormal development of the carpal bones and the epiphyses of the radius and ulna represent a development corresponding to the other joints and their epiphyses. Also that the centers of ossification of the wrist appear and follow each other in such regular developmental succession that they can fairly represent grades of development from birth to fourteen or fifteen years. There is only one small point on which our anatomic work differs and that is that while Professor Pryor found that the trapezium was the seventh ossific center to appear, I found that this center was represented by the trapezoid. It is possible that Professor Pryor is right, but the difference, so far as the principle of an anatomic index is concerned, is insignificant in carrying out its practical application for the grading of children. The number and massing of the bones is, for my purpose, much more important than their especial order.

My own Roentgenographs of the order of development of the bones of the wrist arranged alphabetically have already appeared in the Transactions of the Association of American Physicians for 1909. These representative developmental divisions can be fairly used to designate groups in such a way that by taking children of the same degree of development we can grade them in kindergarten, school, athletics and in different kinds of manual labor, without distinction as to whether they are boys or girls, of one race or of another, of one family or another, or whether they are sick or well.

In addition to a few of my own pictures I am presenting several which have been given to me by Professor Pryor. These pictures show how in the same family the girl's development is earlier than that of her brother, and then again how in different families the development of the bones differs.

Plate I. is the hand of a girl six years of age, showing the usually found earlier development of the girl over that of her brother, shown in Plate II., whose age when taken was six and one-half years. Plate III. illustrates how the development of the bones differs in different families. This hand is that of a girl three and one-half years of age, and yet it presents just about the same development as that shown in Plate I., a girl six years of age.

Plate IV. represents the development of the wrist which corresponds to the kindergarten period of life. Plates V. and VI. correspond to the school periods. Plate V. represents the hand of a girl five and one-half years of age, and Plate VI. that of a girl eight and one-fourth years of age. Plate VII. corresponds to the Child Labor period and represents the hand of a boy thirteen and one-half years of age.

The plates in this paper, excepting the three given to me by Professor Pryor, were taken from the Roentgen records of the Children's Hospital.

For the convenience of those who have not read my previous communications on this subject I offer the following summary:

SUMMARY.

1. There is a manifest need for some developmental index by which physicians acting as an advisory council to the people shall be able to determine the fitness for school and for the physical work of the early years of life.

2. The means formerly used for this purpose are inadequate, whether they may be by height, weight, teeth, statements of parents or guardians or birth certificates.

3. The physiologic test by the pubic hair as worked out by Crampton is an exceedingly valuable contribution, and if, as is possible, it correlates with a more practical anatomic index will aid in deciding in doubtful cases. It evidently, however, from its very nature is not a test which should be widely used in the schools or courts, and it only covers a comparatively short period of life and is one which is not applicable to many questions connected with early and middle school life.

4. Physiologic conditions will probably be found to correspond to anatomic, and great credit should be awarded to Crampton for his suggestions and work directed to the future discarding

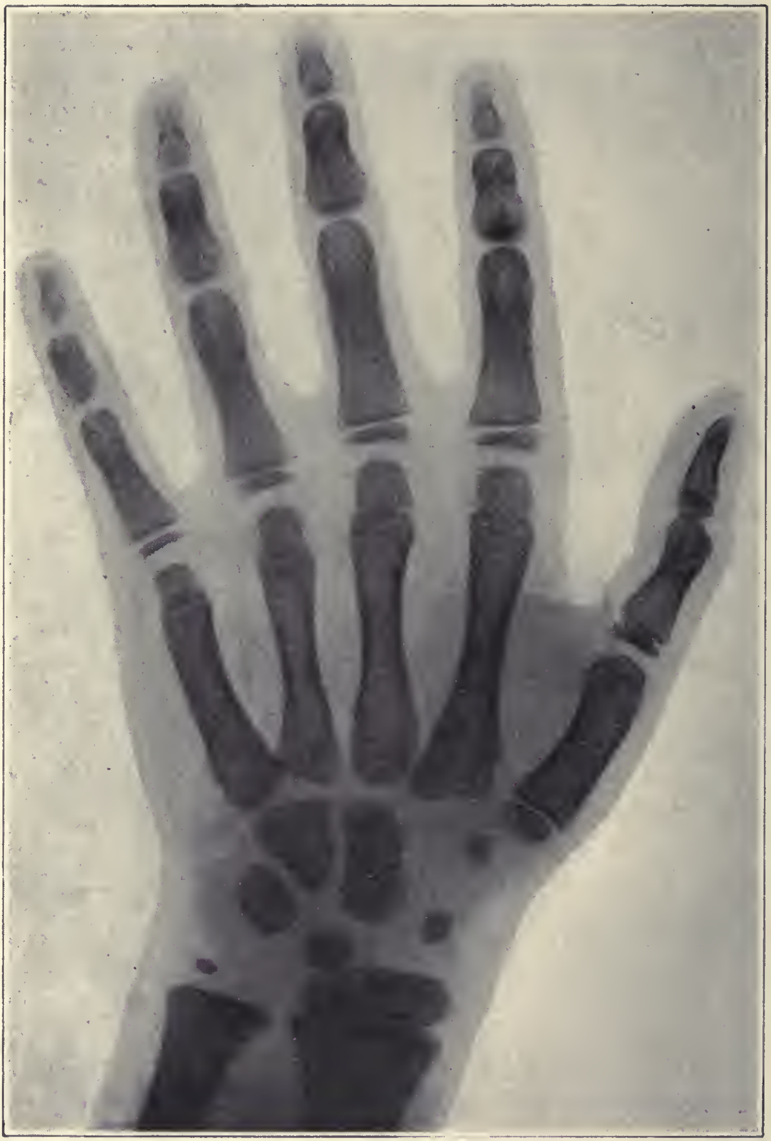

PLATE I.

Girl, age 6 years, sister of boy, age 6½ years, Plate II.

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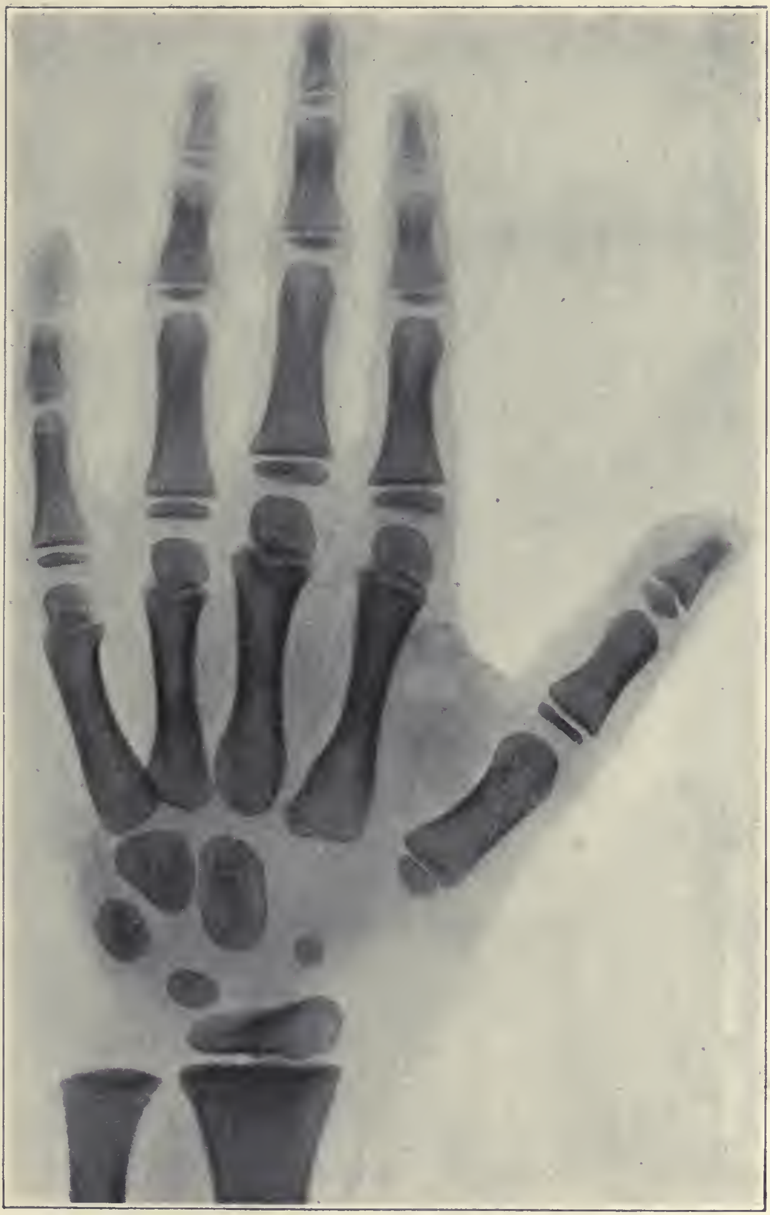

PLATE II.

Boy, age 6½ years, brother of girl, age 6 years, Plate I.

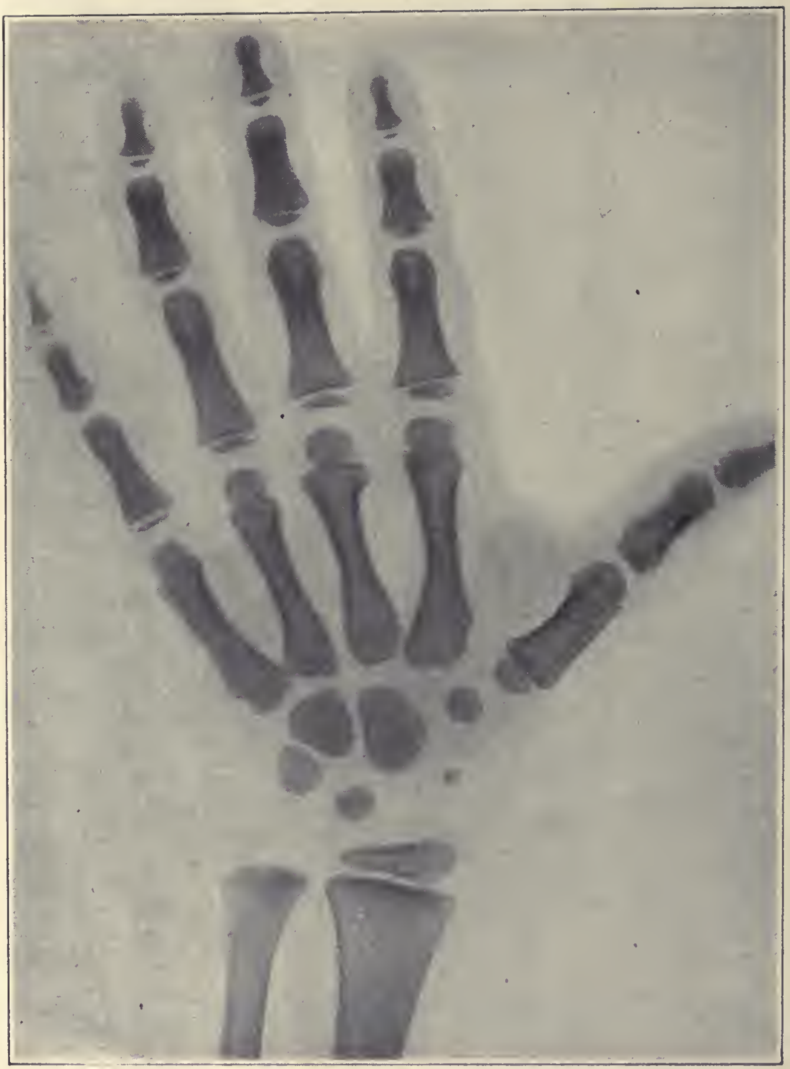

PLATE III.

Girl, age 3½ years. Development about the same as girl, age 6 years, and boy, age 6½ years.

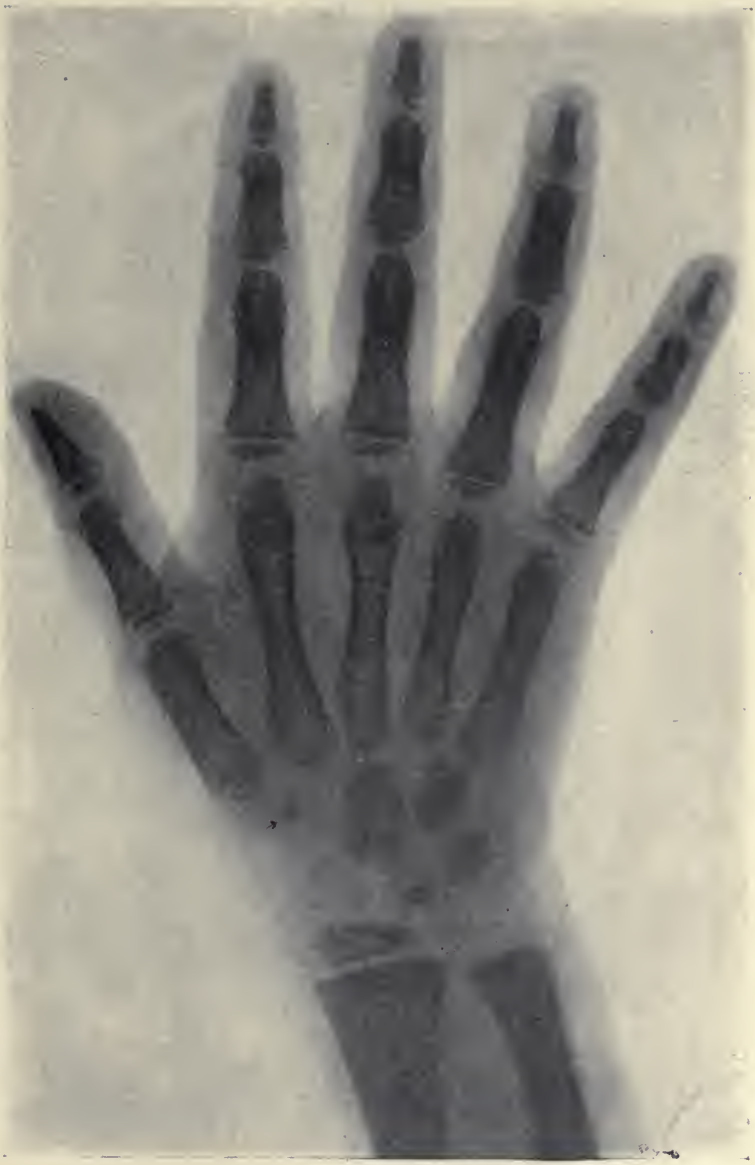

PLATE IV.

Girl, age 3½ years. Represents the development of the Kindergarten Period.

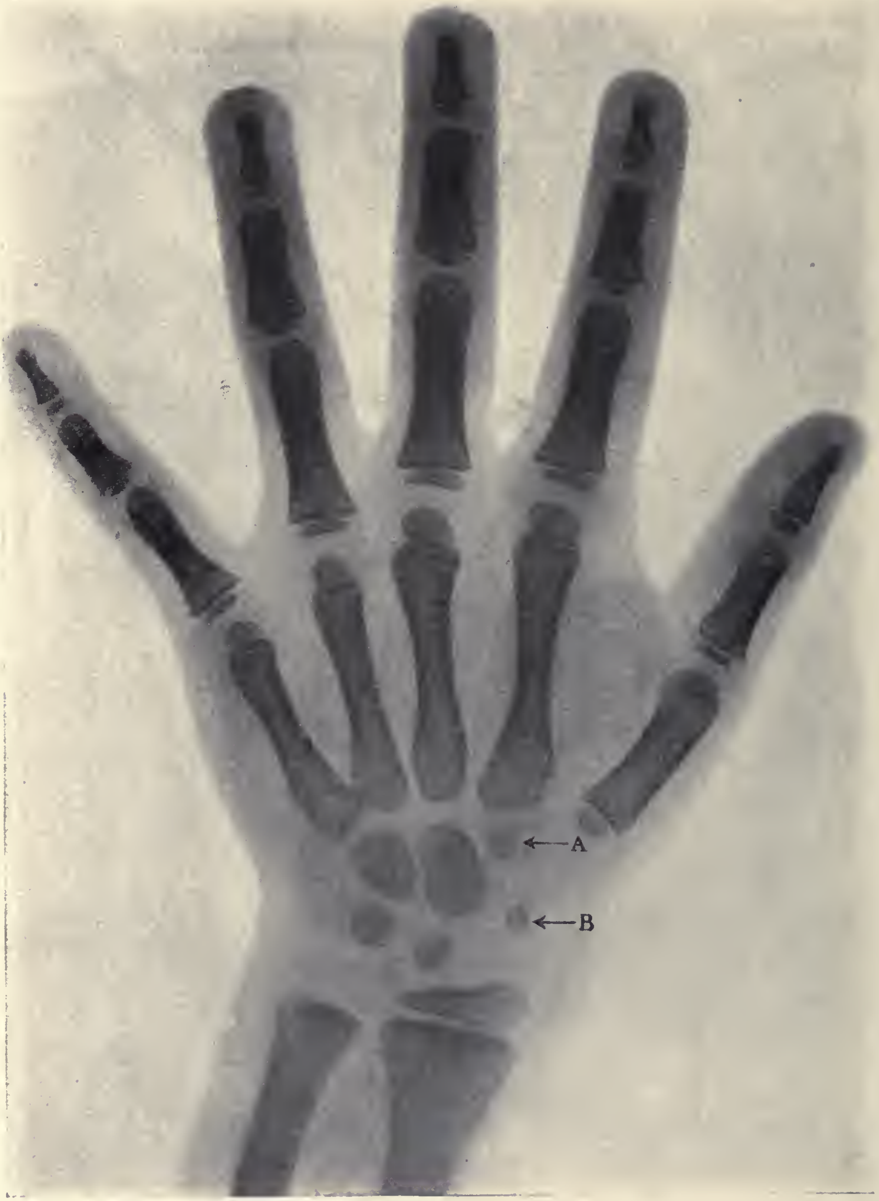

PLATE V.

Girl, age 5½ years. Represents the development of the early School Period.

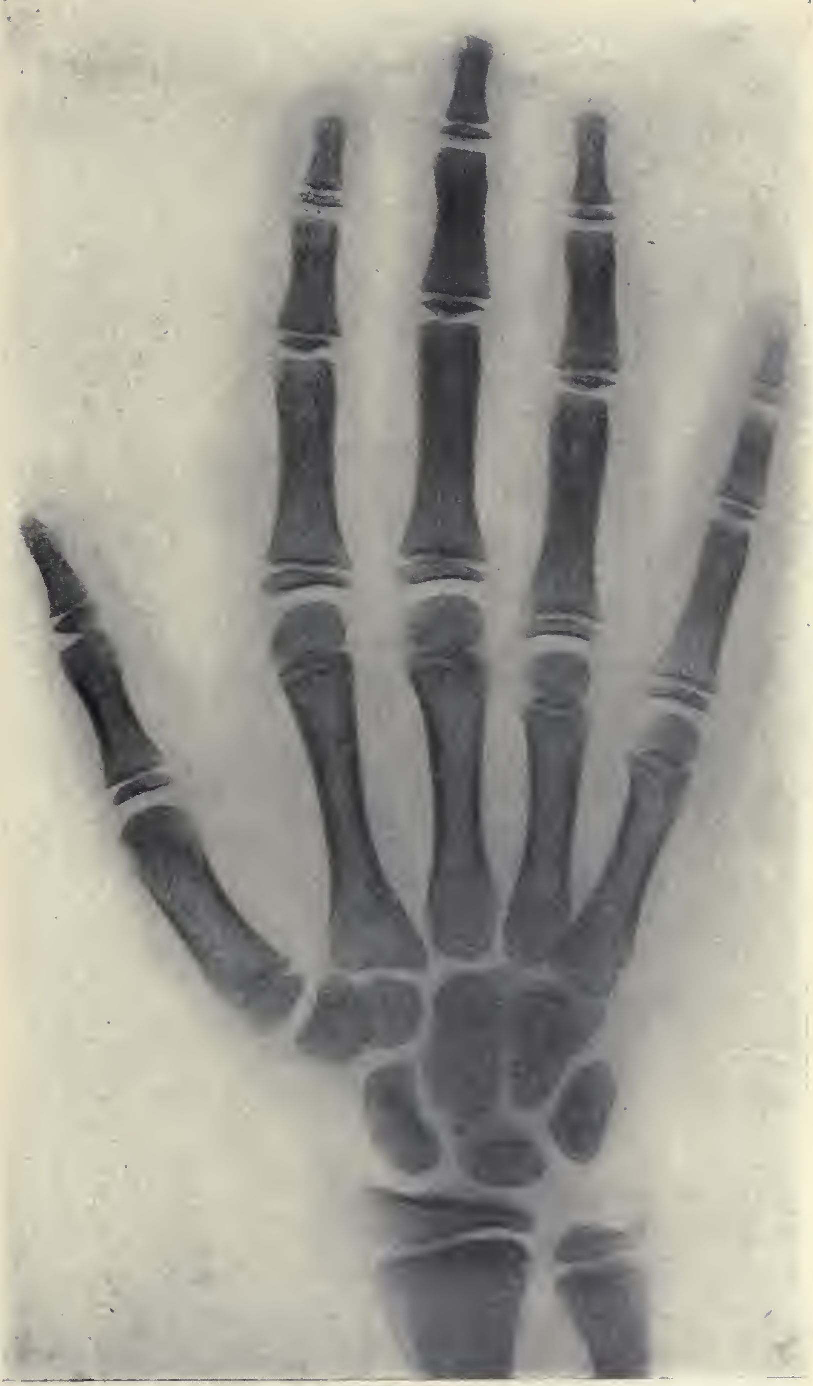

PLATE VI.

Girl, age 8¼ years. Represents the development of a later School Period.

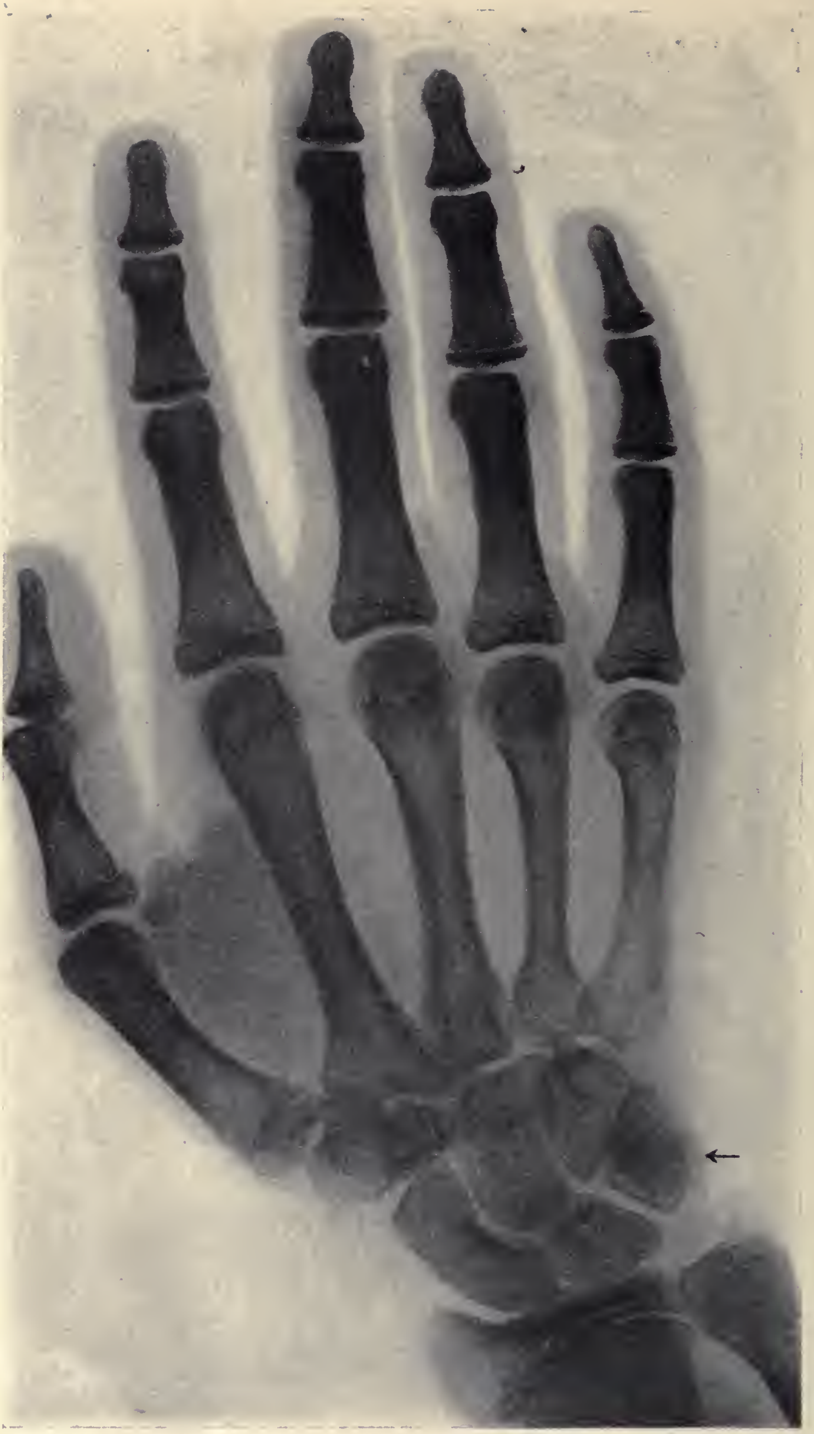

PLATE VII.

Boy, age 13½ years. Represents the development usually existing in the Child Labor Period of a number of the States in America.

of chronologic age as the most important guide in solving the problems of early life.

5. Height and weight have long been known to be very inadequate for determining chronologic age and have been conclusively shown to be so by Crampton.

6. Pryor has shown conclusively, and my observations uphold his, that there is a marked difference in the anatomic development of children according to sex and family.

7. The consensus of opinion among odontologists is that the eruption of the teeth as an index of age is illusive and very unreliable.

8. The skeleton represents an illustrative steel framework of development on which the body is built, and this development, when determined, presents the best source from which to evolve an anatomic index for practical use for the safeguarding of early life.

9. The most important part of the skeleton for use as an index lies in the joints.

10. In early life the most important part of the joints is represented by the epiphyses which form the vital parts connected with the growth in height, as centers for infection and for the dissemination of disease.

11. The carpal bones and the lower epiphyses of the radius and ulna represent the other joints to such a degree in so many instances, and are so much more in evidence and so readily interpreted by the Roentgen method that they can be practically used as an index of development representing the entire bony framework.

12. The best way to use the wrist as an anatomic index is to empyrically classify the carpal bones and the lower epiphyses of the radius and ulna alphabetically in groups.

13. In addition to showing the degree of development these groups signify degrees of possible strength on the ground that the larger the number of bones the greater the strength.

14. The educators and the school teachers should, after advising with the pediatricians, determine what degree of physical and mental development is required for the different grades of kindergarten and school and preliminarily place in those grades the groups of children who show the anatomic index which corresponds to what those especial grades require.

15. In like manner the requirements of certain physical ex-

ercises, whether in sports or child labor, should be determined in order that the especial expenditure of physical and nervous force needed for such exercises can be fitted to the especial child.

16. In regard to questions such as Child Labor the philanthropists and those who are especially working for the betterment of child life should withdraw children from unfit labor and obtain information of the especial child's needs from the physicians in accordance with race, family and other conditions of life. The physicians should also determine in what group the especial child belongs, physically and mentally, and state which work it is fitted for.

17. Under the physicians' advice the lawyers should frame sensible and practical laws on a developmental basis, and the legislators should enact such laws whether for the State or for the country at large.

18. While chronologic age in legal questions must be recognized, yet for practical reasons and for the safeguarding of early life we must pay especial attention to the other two types of ages, the physiologic and the anatomic.

19. Finally we must not be misled by thinking that the development of the epiphyses always means actual general physical strength, such as may be found in an individual as for instance by using the Ergograph (R. G. Freeman, *American Journal of the Medical Sciences,* November, 1908). The muscles may be weak and the grasp of the hand may not be up to what may usually be considered the standard, but such a condition should be considered to be abnormal and the individual child should be treated as a sick child and not be classified by the degree of strength which it shows. On the other hand, the carpal bones and the epiphyses of the radius and ulna indicate what the development really is and has been, and the muscular strength and endurance should then be worked up to the degree of development shown by this anatomic index. The individual should be classified just as is done when there is an over-bright brain and a corresponding lack of physical development, and should be relieved from study and improved physically until its anatomic index equals its brain capacity.

The bones of the wrist, therefore, unfold to us an underlying evidence of development which can be used practically for grading in early life, and this Anatomic Index can be disclosed during life and without harm to the individual by means of the Roentgen ray.

DISCUSSION.

THE NEED OF, AND THE RELATION BETWEEN, A DEFINITE ANATOMIC DEVELOPMENT AND CHILD LABOR.

Dr. L. E. La Fétra.—With the general position of Dr. Rotch's paper I am in hearty accord. I have the feeling that, occupying the position it does, the American Pediatric Society should in some way take the lead in devising measures for the protection of children. The plan which Dr. Rotch proposes, that the Society should each year take up some topic with regard to the safeguarding of child life, seems to me an admirable one. The publication of such discussions by this Society would call the attention of the medical journals, and of the lay press as well, to various important topics which might well be the subject of our Society's attention.

It would seem that the chief difficulties in safeguarding child life are not those of ignorance, but the nonenforcement of existing laws in those states where the laws are good and the absence of a public sentiment demanding good laws in many other states. The part which physicians can take is largely the creation of public sentiment, first for the enforcement of existing laws, and, second, for the enactment of better laws in special states and to overcome particular conditions. For various parts of the country the problems and difficulties are different. In the matter of child labor, for instance, we have the problem in New York State of the children that are overworked during school vacations, especially in the canneries in the country. We also have the problem of the little children, some of whom are under school age, who are overworked in tenements that are licensed as home factories. These cannot be reached by existing laws.

There are certain crying evils that have been very satisfactorily attacked by many of the states throughout our country, but one of the great difficulties is the lack, in the states, of uniformity of legal requirement. Dr. Rotch's paper upon a method of determining the age of children indicates one of the problems continually arising where parents induce their children or the children themselves wish to engage in gainful occupation before they are really able to undertake it. This Society might very well make it a subject of investigation and discussion, "What is the minimum physical development necessary for a child to undertake various kinds of work?" The hours and conditions of such labor should also be investigated.

There are various other problems which might be studied. Some of these have been partly worked out. For example, the prevention of blindness in the newborn. In New York City the regulation of the practice of midwives has recently been very satisfactory, and it is believed that comparatively few cases arise from that source at the present time in New York City. There are many states and cities, however, in which there are either no, or inadequate, regulations, and in the last report of the New York Association for the Blind there is ample evidence that the medical profession could do much throughout the country to prevent the development of ophthalmia neonatorum.

During 1907 there were admitted to the ten principal schools for the blind in the United States and Canada 242 new pupils; of these 59, or 25 per cent., one-quarter were blind because of ophthalmia neonatorum. As we all know, this ought to have been prevented in almost every case; and the blindness of these 59 children is, therefore, needless. In the United States it is estimated that there are between 6,000 and 7,000 persons totally blind from ophthalmia because the well-known Crédé's prophylaxis was not used at time of birth.

In New York State there are only three counties outside of New York that have legally constituted Boards of Examiners for midwives. Rochester now has a Board of Examiners. Notwithstanding these Boards and their regulations, the practice of these midwives, even where licensing is required, is far from what it should be. Miss Crowell's report in 1907, after visiting 500 midwives in New York City, stated that of 303 obstetrical bags inspected only 34 were clean enough to be regarded as first class. The regulations themselves are good, but there is no supervision nor correction unless something wrong happens. Then the investigation begins and the midwife's license may be revoked—after the damage is done. And yet in Buffalo and New York nearly one-half the total number of births in 1905 occurred under care of midwives. Fortunately the American Medical Association, by its Committee on Ophthalmia Neonatorum, has taken up the subject and very satisfactory progress has been made in the way of making recommendations for the more general regulation of midwives, the issuance of circulars of instruction and the distribution of bulbs of 1 per cent. silver nitrate. A good recommendation is that the birth certificate shall be filed within twenty-four hours, and on the certificate it shall be stated what preventive of ophthalmia neonatorum was used; also, if none, why not.

Prevention of the spread of disease in schools has been advanced greatly by medical school inspection. But much remains to be done. In the day nurseries of New York 4,000 children are on an average cared for daily. It is especially in day nurseries that young children are liable to contract disease, so that more careful regulation is needed. In particular, there should be a ban upon cases of vaginitis; for no matter how innocent and simple these may appear, the gonococcus is found in the majority of all cases examined. The diapers taken from all the children should likewise be sterilized and should not be mingled with others in a common tub until they have been boiled. Again, overcrowding is to be prohibited. The minimum air space per crib, according to Dr. Darlington, should be 230 cubic feet instead of the old requirement of 100 cubic feet called for in the New York Board of

Health rules and regulations. In many cities there is no regulation whatever nor any medical supervision of day nurseries. It is really a serious question whether children with vulvovaginitis should be allowed to attend public schools. In the regulations for our gonococcus patients at the Vanderbilt Clinic we forbid, though without authority, the children from going to school. The use of the general closets by such children should certainly be prohibited.

In the school life of children there are certain problems which call for investigation. First, the number of hours of work; next, the matter of the midday meal. The curriculum for girls should certainly include, perhaps at first as an elective class, something about the care of young children. "Little mothers'" classes for summer vacation schools already established in New York are a great success. More knowledge of household economy, of cooking and the care of food should be given to girls; this is prophylaxis of the best kind. These girls have the care a large part of the day of the baby or younger children in the family, and if properly taught they instruct the mother and prevent many errors in hygiene. It is thus possible to reach foreign mothers more satisfactorily through the girls who understand the lectures than by talking directly to the mothers themselves. Six physicians from the New York Department of Health give lectures to mothers and older girls at the various playgrounds and vacation schools. One incident of last summer is worth repeating. It brought home vividly the large part these children have in the care of the tenement babies. "According to instructions, one of the doctors was lecturing to a group of mothers whom he had gathered on a recreation pier. During the talk he noticed a small girl who dragged after her a most reluctant older woman. She held that woman where she could hear the lecture, literally by force of arms. At the end she turned and faced the woman triumphantly: 'There. didn't I tell youse that the doctor says y' mustn't feed no more pickles to the baby?'"

For boys, not only manual, but actual industrial or vocational training should be given, and this despite the opposition of the labor unions. Such instruction enables the boys to earn more when they do work, so that fewer hours of labor are necessary to earn what is needed. Moreover, it fits them for later usefulness. At bottom nearly all sociologic difficulties are a matter of dollars and cents; we can assert that they are all due either to poverty or to ignorance. The school should fit the child to earn his living while it is giving him instructions how to live.

Playgrounds, parks and school gardens are necessary factors in the proper development of the city child, and the medical profession should make its influence felt toward securing and enlarging these beneficent agencies. Quite recently in New York the attempt has been made by two worthy organizations to appropriate a part of two of our parks. Fortunately the attempt was not successful.

The subject of child labor is a large one and the bad effects of prolonged work, work at night or work by young children, are too obvious to need comment. The efforts of the various leagues and committees are having a marked influence in stirring public sentiment against this evil. The keystone of the child labor problem at present is the age limit and compulsory school attendance up to that age. There is general agreement that the lowest age limit for employment should be fourteen years. The New York laws, which are the most stringent, require not only documentary proof of age, but that the child, before receiving working papers, shall present evidence that he has had a school course of not less than eight years.

Documentary proof of age is not required in fourteen states, four territories and in the District of Columbia. This puts a premium upon perjury by parents or guardians. Moreover, deception and evasion of factory inspectors is frequently practised by foremen. It is manifest that the only reason for any age limit is to make sure the physiologic fitness of the child. It would therefore seem that some more direct physiologic or anatomic standard would be not only capable of easier enforcement, but that it would go more directly to the heart of the matter and prevent the employment of undersized or weakly children.

In the last report of the Consumers' League on the subject of Child Labor Legislation, there is a brief discussion of what should constitute an effective child labor law. Among other prohibitions is this: that no child who is less than 60 inches in height or less than 80 pounds in weight shall be employed. These figures represent about the average height for a boy of fourteen, but the weight average for a boy of twelve and one-half. Surely it would seem best to raise this standard of weight to at least 90 pounds, which is the weight for a boy or girl at about thirteen years. It is a question whether the weight standard for girls ought not to be raised to 100 pounds. This is the average for girls of fourteen years. It is usually about this time that menstruation is established, and overwork, especially long standing during its early and irregular functioning, undoubtedly lays the foundation in many cases for invalidism or sterility. Dr. E. A. Tucker, long resident physician at the Sloane Maternity Hospital, told me that it was his experience that shop and factory girls are very apt to have the infantile type of cervix, with undeveloped uterus, and it was his opinion that this was due to standing too much in early menstrual life.

Unfortunately, on account of differences in the growth of different races (Scotch, Russians and Japanese for example), these height and weight standards do not prove a satisfactory index to the capacity for work. It is exceedingly desirable that some easily applied physical test or standard be discovered. If we are to protect our greatest national asset we must safeguard our boys and girls and ensure to them an unthwarted physical development by preventing them from undertaking work for which they are as yet not fit. Dr. Crampton's standard, involving, as it does, exposure of the person, is impossible of easy application. Dr. Rotch's test of the wrist bones by the Roentgen ray holds out a promise which I sincerely hope other investigators may confirm as a reliable index of the physical and mental capacity of the growing boy and girl.

DR. SAMUEL S. ADAMS.—The main reason for my having accepted the invitation of Dr. Rotch to discuss his paper was that after having sat in the Secretary's chair for the past eighteen or nineteen years, on many occasions when the other members have betaken themselves to the recreations of the smoking room, or elsewhere, many ideas have filtered through my brain and been crystallized, and the principal one of these, perhaps, is that this Society has never taken the stand it should have taken in the matter of national affairs. Having been somewhat intimately connected with efforts at legislation of the constructive and obstructive kinds during the past thirty years in the Capital City, my observation has been that the medical profession is more apt to be engaged in obstructive rather than in constructive legislation, and this attitude has been assumed on several occasions by this Society. If there is a body of men that is competent to speak on questions relating to the child, from his birth to maturity, this body, both as a body and as individuals, is the one. Therefore, this body as a whole should speak with authority. Now we have all seen the sad picture of medical associations sitting idly by and permitting laymen to have laws constructed for the betterment of the child and then when the laws have been passed criticising them as being inefficient and harmful, and we should now, even at this late day, after twenty-one years of existence, and having reached our majority, assume the position to which we are entitled, that of a body competent to speak with authority on all questions of public interest in regard to the health and development of the child.

The athletics of early life is the portion assigned to me in this discussion. I have been intimately connected with athletic matters in the Georgetown University and have found that my advice has been more sought after in the way of getting favors shown to these young athletes with regard to the faculty than it has been from a medical standpoint as to what boys were competent to engage in athletics.

Recently I was invited to talk at one of the principal high schools in Washington upon the effect of cigarette smoking on boys, and I was struck with the lack of thoughtful literature to be found on this subject; in fact, I came to the conclusion that those who had written on the subject were all cigarette smokers. Now I do not smoke; I tried, but it got the better of me early in life and I never tried again. You cannot stop cigarette smoking by books. You cannot convince a boy that there is enough nicotine in a cigarette to kill three men when he goes home and finds his father smoking a half dozen cigars a day. That is not the way to reach him. The effect of cigarette smoke upon the child as regards his physical development is bad. I have asked a number of genito-urinary men who have kept accurate records, and they tell me that almost invariably the boy under sixteen who comes to them is a cigarette smoker. I took the hint and investigated further as to beer drinking, and found that the boys that smoke cigarettes are the boys who drink beer; the two go together. Can we do anything in this matter? I want to throw out the hint that at some future meeting we take up this question of whether the use of the cigarette is harmful in early life and see if we may not put our stamp of disapproval upon it.

I was connected for a time with one of the leading schools in our neighborhood, where, although the medical officers were supposed to have general supervision over the boys, I was not consulted in any instance as to their development or their fitness to engage in their work or sports, they being sent to an ignorant trainer to determine their competency to engage in athletics. The boy is, of course, anxious to become an athlete. He contests with his companion in an endeavor to decide whether he can successfully cope with them in a certain line, but does not consult the medical adviser as to his physical qualifications. I have in mind a boy on one of the teams whose physical development is so slight that his companions have dubbed him "Mademoiselle." I think we should take a decided stand in regulating the time at which the child should enter the athletic field in the primary schools, in the graded schools and in the colleges. We should have supervision over the boy up to the sixteenth or eighteenth year. Of course, after that it is difficult to control him; those of us who have sons know that.

If this principle brought out by Dr. Rotch today proves to be scientifically accurate, let us use that as a guide in giving advice on this subject. Those of us who have to deal with the schools in this respect can examine the child by this method and advise the parent whether boys should engage in certain sports or not; whether girls should engage in basket-ball or tennis. In my experience girls often endeavor to become experts in such games as basket-ball when physically entirely disqualified to stand such an ordeal. I have in mind at present one young lady who was an expert in this game and achieved a victory over a rival school, but who has been flat on her back for two or three weeks as the result of the physical strain. My advice was not asked in the matter; that was left to the physical trainer, who happened not to be a medical man. On questions of this sort, where the public is concerned, where the child's health is concerned, whether it be national or local legislation that is needed the medical man, and particularly in these cases the pediatrist, is the proper one to step forward. We have all been too modest. I some time ago urged in an address before a graduating class that every doctor engage in the politics of his locality; he should make it his business to know what laws are being passed. He need not hold office, of course, in order to do this. In my city we have no vote, our voting is done for us; we are taxed, but not represented; but you people in the states have the opportunity to exert an influence in these matters. Sometimes a word with an influential man in Congress about these conditions has a good effect. For the past thirty years I have been engaged more in blocking undesirable legislation than in bringing about legislation. Last spring a bill was introduced allowing every man who had served in the Spanish-American War, whether he had served in the medical corps of the army, or navy, or public health and marine hospital service, and who had been honorably discharged or had resigned, to register in the district without examination. That bill passed the Senate Committee of Congress, and would have passed the Senate had we not gotten hold of it. I got a prominent senator and took him to the chairman of the committee, who stated that the bill must be all right, as no one had opposed it. I said, Why, this is a most outrageous thing! Men were put in the army who were not at all fitted as medical men, and now they can come to Washington and register and then by means of reciprocity go and practise in the states. After this explanation the bill was pigeon-holed. Many things of this sort are coming up constantly in the national legislature, and we have to be always on the alert to obstruct them. Now if you would give us a little constructive legislation it would help. In the matter of tuberculosis we sat idly by. We talked about the matter but did nothing. Then laymen stepped to the front and succeeded in getting their bill through while doctors did nothing, although the only ones qualified to give advice as to the construction of such laws. In this way we lose caste in the community. This Society should not be so modest. If our labor amounts to anything let us give the results to the public.

DR. ISAAC A. ABT.—Dr. Rotch has offered a very valuable contribution and no one can doubt that it presents possibilities, the development of which will revolutionize our knowledge concerning the child's developmental status.

The discussion of the kindergarten topics which has been assigned to me scarcely needs to be referred to at great length at this time. The paper was read at last year's meeting and has been published recently. The important facts are still fresh in our minds. Very briefly the findings are, kindergartens vary considerably in efficiency. The results obtained from kindergarten instruction depend upon the ability of the teacher, the character of the kindergarten and the child himself. The plan of Dr. Rotch of estimating the progress of development would be of great importance in selecting children who are fitted for kindergarten instruction and rejecting those who are developmentally immature. Unfortunately we have no method of estimating the physical status of the kindergarten child, just as we have no method of estimating the status of older school children.

If the child fails to keep up the pace set by the teacher, if he breaks down because he is physically unable to keep up with the tasks, then we conclude that he is developmentally below normal.

It is obvious that the information obtained in this way is a sad commentary on our lack of knowledge concerning normal growth and development and general bodily resistance.

Would it be possible to corroborate Dr. Rotch's findings by studying the same cases which he submits to his plan of investigation by making fatigue curves?

The discussion has brought out several points with reference to the position that we should take concerning the practical application of the anatomic index of Dr. Rotch toward the solution of sociologic problems and the advisability of securing recognition from legislative bodies looking toward the adoption of this anatomic index as a standard of growth and development. Personally, I should be opposed under all circumstances to rush headlong into the political arena. I think we are not ready at this time to offer this ingenious work for universal application. I doubt if Dr. Rotch himself will sanction it. I think that the essayist brings this paper to us and desires to stimulate others to carry on the work more extensively so that it may meet corroboration, that the details may be more finely drawn and the whole subject studied in all its possible relations. It seems to me that it is our mission to stimulate and encourage scientific work to the very highest degree. It should be the farthest from our purpose to become entangled in political or legislative questions. Another point occurs to me with reference to the selection of topics for study, and that is, it seems to me, that it is more fitting that this Society should concern itself most with the problems which relate to the first periods of life. When we deal with children who are employed in factories and stores, or if we concern ourselves with child labor laws, we are encroaching on the borderland. The internist on the one hand and the sociologist on the other are already laying claim to the problems of this period of life.

Few others but we are interested in the manifold problems of infantile disease. So much work remains to be done along this line that I would think it a mistake to trespass other fields. At this moment when the whole world is interested in the subject of infant welfare and preventive medicine as it relates to the preservation of child life, we can hardly afford to forsake these topics to branch out into the wider domain.

In closing I desire to express my appreciation to Dr. Rotch for his valuable contribution. It is an original work which leads us into a new field of thought, and it should stimulate many of us to carry on this investigation. It presents possibilities of untold value along the line of classifying children on an absolute basis of physical development.

DR. CHARLES GILMORE KERLEY.—I discussed this subject at our last meeting in my presidential address, and I am glad to see that the members are so interested in the subject. Concerning the grading of schools I stated at that time that there should be a department of hygiene organized to coöperate with Boards of Education. Such a board should be made up of a skilled oculist, an orthopedist, a laryngologist, a pediatrist and a sanitarian, who should be given power to arrange suitable type and printing for the different ages, to consider problems of ventilation and lighting, of posture, of vision, of the nose and throat, of nutrition and growth and of general hygiene and to direct the recreation periods.

In considering a subject like this, a very broad one, we should begin at the bottom and that requires inspection of the home, as to how the parents live and how their children are brought up. The first five years of the child's life are the most important ones as relates to the development. The teaching period is the most important one as relates to his future career as a citizen.

Dr. Rotch, in his paper, offers something definite. He gives us some definite index to judge by in relation to the work of children in factories and the different occupations.

Statistics, as relating to height and weight as having a bearing upon the child's capacity for work, are oftentimes misleading. This fact has been brought out recently very forcibly by the work of Crampton, who disproves the theory that height and weight should be used as an index to the child's capacity for work.

As regards the position of this Society, as to whether it shall go into this field relating to child's study in a general way, there is just this about it, if we don't do it we will simply have to sit by and see others do it because the teachers and educators generally are becoming very much alive to this subject. Recently the Board of Governors of the Teachers College of Columbia invited me to give a course of lectures to teachers on infant and child feeding —simply to the teachers, which was an innovation. The people are awakening to the idea that the medical men know something on this subject that the people as a whole should know, and if we do not take the initiative in the matter some one else will.

DR. L. EMMETT HOLT.—I should feel sorry to see a large part of the work of this Society devoted to subjects of this kind which, though of sociologic interest, are not so much along the line of work of most of us as other matters more strictly medical. I believe we can do our best work along lines of research. No other society in this country stands for that as does this one. Insomuch as the work is research work it should be encouraged, and I should certainly place Dr. Rotch's work in this class, but I am not so sure that it is the function of this Society to go into the sociologic part of it. Dr. Abt's ideas are very much those which I entertain. We should be very sure of our position before attempting to put the matter before the public. This anatomic index should be corroborated by the observations of a number of workers before we, as a society, go on record as endorsing it unreservedly. It looks most encouraging, but we know many observations are necessary to get at the whole truth, and these must be made under many different conditions.

We have a duty toward the public, but that should not be the most important side of our work and we should be careful not to take too positive a stand upon this question until sufficiently sure of our facts.

DR. MORSE.—Dr. Holt and Dr. Abt have expressed my feelings on this subject very much better than I could express them myself. I agree with them fully.

DR. FREEMAN.—This work of Dr. Rotch's is very important so far as it has gone, and there has been sufficient of it for us to accept it without further corroboration. But he has not shown the relation of the development of the carpal bones to the age of the child, the general development of the body, dentition, growth of pubic hair, and so forth, all of which, it seems to me, is very important in order that we may judge of the value of carpal development as an indication of general development.

DR. CARR.—In reference to the study of sociologic questions we are in a position analogous to the churches. They were organized for spiritual work, but go beyond that to reach the people. We were organized to study the diseases of childhood, and the question is, How far can we go into outside matters? Personally, I think many of us as individuals, as members of committees, or through some affiliations we may have, can do a great deal, but I believe that the work of this Society should be largely medical.

DR. ROTCH.—In regard to Dr. Freeman's remarks, I have written on this subject before, and in my paper I stated that this is only one of the factors of the problem and that we must work out all the factors one by one. Because, however, it is only one I see no reason why we should not take it up. All the evidence is in favor of its being correct at present, as is believed by those who have investigated it.

As to devoting ourselves to medical subjects strictly, it seems to me that all over the world it is recognized that prophylaxis is of the greatest importance. To say this is not medical, and that work of this kind should be left to the laity is, I think, absolutely wrong. I believe it is our duty to the public to give them the benefit of our knowledge, and what I have said today is just as much medical as any scientific paper that can be read. What is the use of making these investigations if we are not going to make use of their results for the public good? I see no reason why these are not medical subjects, and I believe they should be taken up by this Society. I do not think the matter should be put aside because we happen to have said a little more about it today than about anything else. The facts presented are medical facts. In New York great numbers of children have been taken out of the sweatshops and mills, but having been taken out the question arose as to what to do with them. According to their age they were put in institutions regardless of fitness. The physician should be able to answer these questions regarding the fitness of the child. We are not entering into politics in this any more than in anything else. How are the lawyers and judges, who have spoken to me over and over again upon this subject, to decide what is best for these children if we as pediatrists cannot tell them? Some one must say what is to be done with the child, and who are more competent to do so than the members of this Society? If we take up the matter of height and weight, as Dr. Crampton has done, we find that the statistics are illusive and misleading, and we cannot make up good laws from these statistics. If there is a better method of determining these questions we should use it. If we take an individual child and see whether it is ready to do a particular work, that has nothing to do with statistics. The matter of height and weight is not sufficient, and if we go on using such methods we are behind the times.

We have nothing to do with legislation, but if we are afraid to stand up and state positive facts it is not a step in the right direction. Prophylaxis is the great principle of the medical work of the future. I brought this up merely to show how to make a beginning, because something should be done. We must treat the child as an individual and not according to general statistics. Of course everything needs corroboration. We have no idea of making this the whole work of the Society. The Roentgengraph is giving us a means of investigation now which we did not have before. I supposed that of course this Society as a whole would wish to lend its influence to broad questions of this kind connected with pediatrics. If, however, it does not so wish, these questions can be discussed elsewhere.

THYROID EXTRACT IN CONNECTION WITH THE TREATMENT OF ADENOIDS AND NOCTURNAL ENURESIS.—Williams (*The Lancet*, May, 1909) gives 13 cases in which he has used thyroid extract in connection with the treatment of adenoids and nocturnal enuresis in children. He believes that adenoid vegetations can no longer be regarded as a cause of nocturnal enuresis. He has had remarkably good results in treating this condition with thyroid extract, although he is unable to explain exactly why good results should follow this method of treatment. His results have been so striking that it would seem worth while to try this method in any obstinate case of this condition.—*Boston Medical and Surgical Journal.*

SPASMODIC STRICTURE OF THE ESOPHAGUS—A CASE DEMONSTRATED BY THE X-RAYS.*

BY L. E. LA FÉTRA, M.D.,
New York.

To the pediatrist, vomiting in young children is always a very annoying and frequently a formidable symptom. As our knowledge of digestion and of developmental abnormalities increases, we find that there are being added to our list new types and additional causes of vomiting. Of recent years our attention has been drawn to the frequency of the vomiting due to stenosis of the pylorus. Last year Dr. S. S. Adams presented before this Society the report of a case, with autopsy, of spasmodic stricture of the esophagus. In his case there was a circular narrowing of the esophagus five inches above the cardiac opening of the stomach. There was found also an enlarged bronchial lymph node adjacent to the stenosed portion of the tube, and above the narrowed esophagus there was a diverticulum. Cases of cicatricial stricture of the esophagus following the ingestion of corrosive liquids are not very uncommon and are very readily recognized. The case to be reported is interesting principally from the standpoint of its diagnosis.

The child, Baby M., aged sixteen months, was seen in consultation with Dr. Everett M. Hawks on April 25, 1909, on account of attacks of vomiting. The baby was born at full term and was apparently normal. On the third day after birth there was discharge of dark blood from the mouth but no subsequent bleeding. Nursing was attempted for three and one-half weeks, and then the mother's milk failed. The baby did not thrive on the breast milk. There was vomiting or regurgitation at or after every feeding. The stools were small and apt to be constipated. Bottle feedings were then given, first of modified milk, then of oatmeal gruel with milk, barley gruel and milk, Mellin's Food and milk. The baby always did fairly well on a new food for about one week and then began to regurgitate. The vomiting was always without fever, except in three attacks which were more serious and were accompanied by a temperature of 102° to 103° F. Careful questioning brought out the fact that the vomiting usually occurred while food was being taken, seldom afterward. When it occurred one and one-half to two hours following the feeding, there were always strings of mucus ejected. At times the baby would take and keep down as much as eleven ounces, and for one period of ten days as much as fifty ounces of food had been taken and retained each twenty-four hours. When the baby was one year old she weighed fifteen pounds. During February of this year there was a severe attack of vomiting and the baby lost weight down to ten pounds. Under the care of another physician who was called into the case the vomiting lessened and the baby began to gain so that by March 23 the weight was thirteen pounds. The quantity of food was increased up to twelve ounces at a feeding. Then the baby began to vomit badly and became constipated. It was at this time that the child came under the care of Dr. Hawks, the physician with whom I saw the case and to whose courtesy I am able to report the case. At his first examination the baby seemed normal save for emaciation and constipation. There was no vomiting. The baby was hungry and took a large amount of food. The stomach was washed out four times. Each time the tube passed down about six and one-half inches and there met an obstruction. It could be forced down about another inch beyond this. A large quantity of mucus was obtained, and the baby would vomit alongside the tube. Moreover, it was found that at the first feeding in the morning, after the stomach had rested all night, the baby would vomit after taking about four spoonfuls of food, bringing up as much as a teaspoonful of firm yellowish mucus together with the fresh food. Then the baby would swallow the food well and there would be no vomiting. If the stomach tube were passed about two hours after the first feeding, mucus would be obtained, and this was probably not from the stomach.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 27, 1909.

The baby was first seen by me on April 25. At that time she was emaciated and her weight was twelve pounds, eight ounces. She had a loose, rattling cough, but the chest was apparently normal. The lungs and heart were negative, as was the throat. There was no distention of the stomach; no peristaltic waves and no pyloric tumor; the liver was two fingers' breadth below the ribs and the spleen slightly enlarged. There was no dullness alongside the larynx and trachea, the examination being made before the feeding. I watched the baby being fed from a spoon. After a few mouthfuls the baby regurgitated some mucus with the food. Then she took about two ounces, stopped and began to fret and put her left hand down her throat and brought up as it were a handful of mucus and food. Then she went on and took the balance of the feeding, some six ounces, without fretting. If her attention were diverted she would keep the food down, and there was usually no vomiting until the next time of taking food.

It was thought from the time of the vomiting and the way in which the child vomited that there must be a pouch of some kind alongside the esophagus. The absence of peristaltic waves on the abdomen ruled out pyloric stenosis. It seemed reasonable to believe that the mucus vomited first came rather from the pouch than from the stomach, and accordingly it was ordered to pass the stomach tube and use an alkaline saline solution for irrigation every second day before the evening feeding. The baby was put upon a malt soup mixture.

On May 7 the baby was seen a second time and the condition found about the same. It was noticed that the stomach tube met an obstruction before entering the stomach and there was usually peculiar noisy breathing and cough immediately preceding the vomiting at the time of the feeding. The baby did not cough between feedings because the cough was always brought on by swallowing. There was a continuance of the habit of putting the hand down the throat and bringing up food and mucus, the mucus being yellow and mixed with very little food. Percussion of the front of the chest was made before feeding and no dullness found. After the feeding distinct dullness was made out to the right of the sternum extending from the first to the fourth spaces. On account of the statement of the mother that the baby vomited much worse when she was excited, one-twenty-fourth of a grain of codein was ordered to be given immediately after two of the feedings. The malt soup was continued. As a result of my second examination I felt quite sure that a pouch would be found to the right of the esophagus, and on May 8th radiograms were made by Dr. E. W. Caldwell, with the assistance of Dr. Hawks, both before and after feeding. Two drams of bismuth subcarbonate were used in six ounces of food. On May 11th the baby had made a gain of one pound from May 7th. The vomiting had been much less since the administration of the codein and the baby was able to take very thick liquid food. As a result of the X-ray plates it was decided to give the codein before two of the feedings and before the other to use 15 m. of olive oil. It was thought better to use no irrigations of the distended esophagus.

The X-ray picture taken before feeding showed nothing abnormal. Incidentally the centers of ossification of the sternum are shown very clearly. The X-ray plates taken after the feeding which was mixed with bismuth showed a dark shadow extending down to about the seventh dorsal vertebra. This shadow terminated in a conical shaped pouch directed toward the left. Below and to the left is seen the shadow which represents food mixed with bismuth in the stomach. The stomach is apparently contracted, giving somewhat an hour-glass appearance. Between the stomach and the lower end of the esophageal pouch there is no intensification of the shadow. This would seem to mean that all the food with the bismuth had been passed entirely through

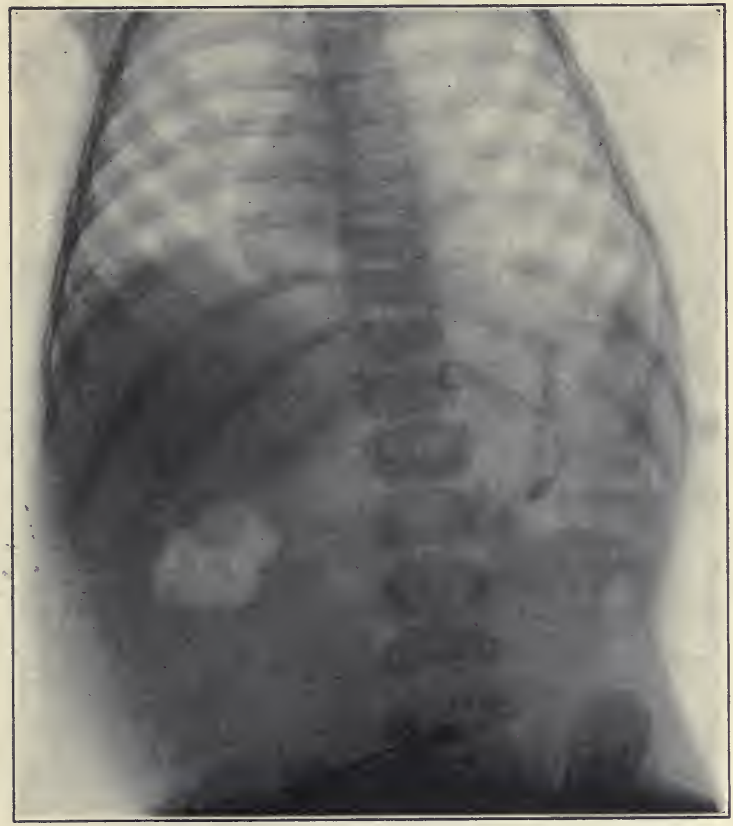

FIG. 1. Antero-posterior view taken before feeding. Note that the area to right of the sternum is clear—a normal picture.
X-rays by Dr. E. W. Caldwell.

that portion of the esophagus and would seem to contraindicate an organic stricture. If there were an organic stricture it is reasonable to believe that some of the food would have been caught and held along the tract.

I wish here to acknowledge my indebtedness to Dr. Caldwell for his careful radiograms, as also for his assistance in the interpretation of the plates.

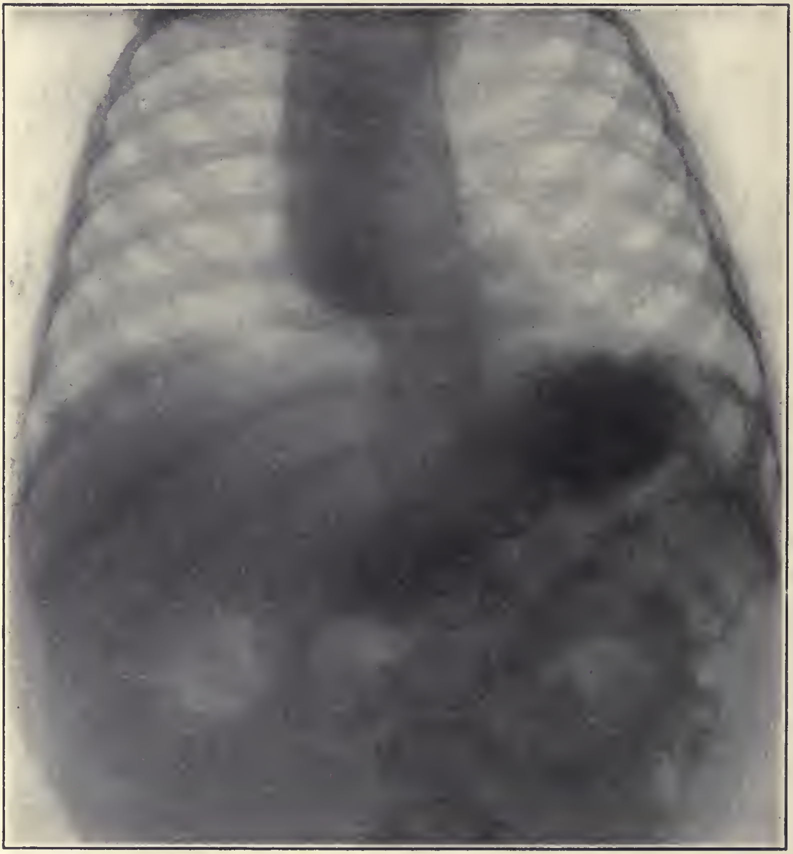

FIG. 2. Antero-posterior view taken immediately after feeding, in which were mixed 2 drams of bismuth subcarbonate. Note the dark shadow at the right of the sternum, most intense at the lower part, where it is conical and directed toward the left. This shadow represents the esophagus distended above the stenosis at the cartilage between the seventh and eighth dorsal vertebrae. Note also the deep shadow showing the stomach in peristalsis and the absence of any dark line or shadow connecting the stomach and esophagus.

The radiogram taken from the side showed that the distended esophagus occupies its normal relation to the spinal column antero-posteriorly. In this picture there is also a clear space between the lower portion of the distended esophagus and the stomach.

I wish here to acknowledge my indebtedness to Dr. Caldwell for his careful radiograms, as also for his assistance in the interpretation of the plates.

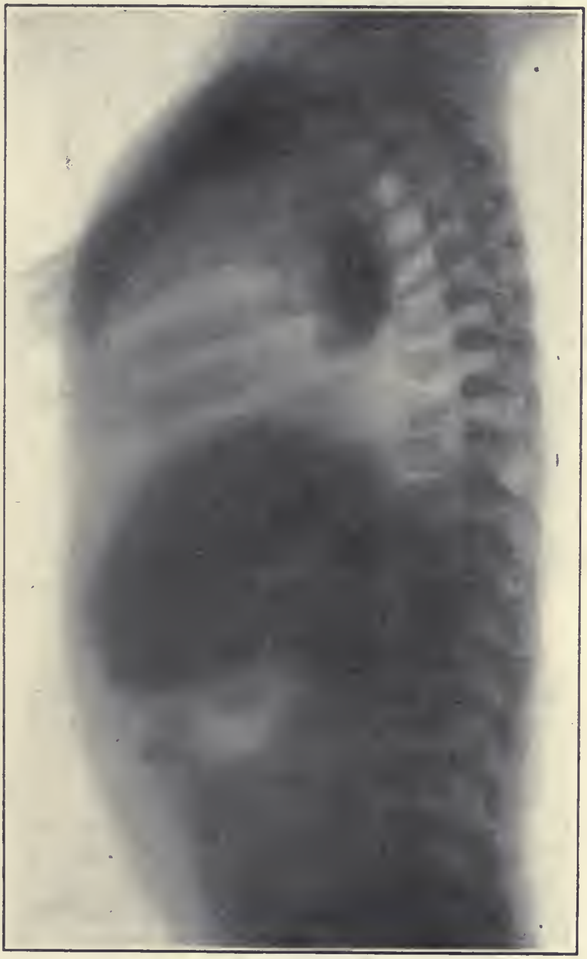

Fig. 3. Lateral view, taken after feeding. Note the distended esophagus in its normal position in front of the vertebrae. The stomach shadow is merged with that of the liver.

As regards the classification of this case, it is one of spasm of the esophagus itself rather than cardiospasm; for the stenosis in this instance is at least two inches above the cardiac end of the stomach. There is found, however, the same distention as occurs in cardiospasm only at a higher level. This distention produces a pouch which acts as a forestomach or "Vormagen." This serves as the reservoir for food and empties by jets into the true stomach.

The passage of metal sounds or of firm bougies was not attempted in this case because of the disastrous results that have been reported from such procedures, not only in the literature but especially at the discussion of Dr. Adams's case in this Society last year.*

Dr. Adams said that but 1 case resembling his could be found in the literature at the time of his report. I have gone through the literature appearing since that time and do not find another. There was, however, one article, a paper on cardiospasm by Guisez and Léopold Levy which I was unable to consult, since the volume containing it was at the binder's. During the past year there have been numerous reports of cicatricial stricture of the esophagus in children, the most notable being that of Ashurst; and there have also been a few reports of spasmodic stenosis or spasm of the esophagus. All of the latter, however, have been cases occurring in adults or older children and have been attributed to hysteria or other marked nervous disturbances.

DISCUSSION.

Dr. Rotch.—This is an exceedingly valuable presentation. It shows what the Roentgen ray can do, and it is certainly a case where the Roentgen ray is needed in examination.

I have had one case occurring in the lower part of the esophagus, before the time of the Roentgen ray, and we were afraid to pass the sound. The symptoms corresponded to what we get where there is a foreign body or obstruction in the esophagus. It is very difficult to differentiate between pyloric stenosis, dilated stomach and spasm of the esophagus. It is a very valuable thing to have aid of this kind. It is wonderful and true to the letter. We now have a method by which we simply turn the leaf of the book and read what is the matter. With my patient it was shown postmortem that we were right in not using a sound, as there was a perforation of the sac.

These Roentgenographs represent most beautiful presentations of our modern advanced methods of diagnosis, and Dr. La Fétra is certainly to be congratulated.

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* On September 17, 1909, I learned from Dr. Hawks that the baby has done fairly well during the summer, vomiting much less (mostly mucus, and at night) and gaining in weight. The codein had to be discontinued, and tincture of belladonna was used instead, to check the secretion of mucus in the pouch as well as to relax the spasm.

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GASTRIC CAPACITY OF INFANTS.

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A great deal has been written on this subject, and yet there remains a certain feeling of dissatisfaction concerning our knowledge of the gastric capacity of infants and its practical application in infant feeding. The size of babies' stomachs has been determined in every possible manner[1]—on the living subject, on the dead subject, *in situ,* and after extirpation, by means of air and by means of water under various degrees of pressure. The result is that there are carefully compounded tables of figures that represent gastric capacity under certain fixed conditions. These conditions, a persistently closed pyloric valve allowing no escape of food into the intestine, a constantly closed cardiac end of the stomach and a uniform pressure throughout the interior of the organ, are of necessity present when the gastric capacity is obtained by any of the methods employed. However, during gastric digestion, as will be shown in the second half of this article, none of these assumed conditions holds true.

Taking such measurements as a standard for the amount to be fed at one nursing, an infant is usually put on a two-hourly schedule and fed the quantity that the "measured size" of its stomach demands. Among the facts brought forward in the study of the physiology of the digestive organs, particularly within the last decade, there are many indications that the accepted figures for gastric capacity need some revision before we base upon them a hard and fast rule of the quantity to be given an infant at each feeding. A consideration of these facts leads to the belief that while the figures represent accurate anatomic measurements of the stomach, the "physiologic capacity," the amount of milk that an infant should ingest at each meal, is a figure at variance with the "anatomic quantity."

In this connection the interval between nursings also plays a very important rôle in the management of infant feeding. A large meal obviously requires a longer period of time for its digestion than a smaller one;[2] cow's milk remains longer in the stomach than human milk;[2] and milk mixtures containing much cream pass more slowly through the pylorus than those low in their percentage of fat and higher in proteids and carbohydrates.[2, 3] In short, both the quantity and quality of the milk are factors to be reckoned with when the nursing schedule is devised. For all these reasons the physician, besides indicating the amount and kind of food to be given at each nursing, should consider carefully the interval between feedings in every case, that is, adjust them to the physiologic laws of gastric digestion.

The following tables were obtained from observations on children at the New York Foundling Hospital. The nursings were given every three hours in each instance, for the reason that the nurse in charge had to care for about ten babies, and any variation from a three-hourly schedule would have made systematic and adequate attention impossible. The amount of milk given at a nursing was never forced. In not one case was there regurgitation, vomiting or other sign of overfeeding. The milk was increased in quantity only when the infants emptied every bottle greedily and did not seem satisfied with the size of their meal. In the accompanying chart the maximum number of ounces taken for at least one-third of the nursings during a period of several days is taken as the figure representing the "ounces of milk ingested at each nursing." During the last week or two of life these cases, dying of marasmus as many institutional children will, in spite of all human effort to the contrary, naturally became feebler and did not take the milk in as large quantities as noted:—

TABLE I.

TABLE SHOWING THE AMOUNT OF MILK TAKEN AT EACH NURSING COMPARED WITH THE POSTMORTEM GASTRIC CAPACITY.

Age.	Oz. milk given at each nursing.	Oz. milk ingested at each nursing.*	Postmortem gastric capacity in oz.
4 weeks	3	3	2 3/8
4 "	3	2½	3†
5 "	4	4	3
5 "	3	3	1
5 "	3	3	2
5 "	4	4	1 1/8
6 "	3	2	3

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* The maximum number of ounces usually taken by the child is listed here; larger amounts, consumed in exceptional instances, are not made use of in this table. The interval between feedings was three hours in every instance.

† "Diastolic stomachs" expanding beyond limits of abdominal cavity on being dilated with water.

Age.	Oz. milk given at each nursing.	Oz. milk ingested at each nursing.*	Postmortem gastric capacity in oz.
6 weeks	3	2	$5\,{}^{3}/_{8}$†
7 "	5	5	2
7 "	3	3	$1\,{}^{6}/_{8}$
7 "	3	3	$3\,{}^{5}/_{8}$†
9 "	4	4	$3\,{}^{4}/_{8}$
11 "	5	2	1
11 "	5	5	$1\,{}^{4}/_{8}$
11 "	3	2	$1\,{}^{2}/_{8}$
13 "	4	3½	2
14 "	3	3	$2\,{}^{2}/_{8}$
16 "	4	4	$1\,{}^{6}/_{8}$
18 "	6	6	3
19 "	4	4	$3\,{}^{4}/_{8}$
21 "	5	5	$2\,{}^{5}/_{8}$
35 "	6	5	$4\,{}^{6}/_{8}$
?	4	3	$4\,{}^{3}/_{8}$†
?	5	5	$3\,{}^{4}/_{8}$

TABLE II.

TABLE GIVING AVERAGES FOR THE 24 CASES STUDIED.

Amount of milk offered at each nursing, in ounces	4.0
Amount of milk ingested at each nursing, in ounces	3.6
Postmortem gastric capacity, in ounces	2.6‡
Normal gastric capacity for children of corresponding age	3.5§

After death the gastric capacity was ascertained with as little disturbance of the natural conditions as possible. A median incision was made in the epigastrium, the pylorus was closed by means of a ligature or artery clamp, the esophagus, after being exposed within the thorax, was divided, a cannula, with rubber tubing and funnel attached, was tied into the distal end, and water was allowed to flow into the stomach until it would hold no more. (The length of the tubing, funnel and cannula were so arranged that the apex of the funnel was about 6 inches above the level of the body, which was lying flat on the autopsy table. In this manner a water pressure of 6 inches, or about 15 cm., was used to dilate the stomach. Pfaundler,[1] in his extensive researches, considered that this procedure most closely reproduces normal conditions and yields more uniform results than either a higher or a lower pressure. A water pressure of 15 cm., as will be shown further on, probably exceeds that existing throughout the entire stomach at any given time during life; hence these figures show results which are too large rather than too small.) The cardia was then closed by means of a ligature or clamp, the stomach cut out of the abdomen, and the contained fluid measured in a cylinder.

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‡ The gastric capacity of these infants is smaller than that of normal children, which is explained by the fact that they were poorly developed, being below the normal standard in both weight and length.

§ Pfaundler's 1 measurements were used, since he employed the same pressure (15 cm. of water) as the author, in determining the gastric capacity of normal cases.

Pfaundler,[1] in measuring gastric capacity, found that the musculature of the stomach wall in some cases showed very little resistance to the distending fluid, in others very much more; this investigator distinguished between these two types, designating the former as "diastolic," the latter as "systolic." It was partly to equalize this difference in muscle tone that a pressure of 15 cm. was used.

In the present series of cases there were several, as indicated by a †, that showed distinctly "diastolic" stomach walls. In some instances, the anterior gastric wall bulged beyond the incision in the epigastrium, when the distention had been completed. At first sight it would seem as though such stomachs must have been stretched during life and that a pathologically dilated organ was demonstrated. However, when the average maximum amounts of milk taken are compared with the capacities of these "diastolic stomachs," it is seen that the fluid ingested does not equal the volume of the apparently dilated viscus. Therefore it is probable that the quantity of food was not the cause of the excessive size of these stomachs but that some inherent lack of tone due to chemical decomposition or other postmortem factor is responsible for the large "diastolic stomachs" in this series. Furthermore, during life the abdominal wall would of course have limited the distensibility of the stomach.

The conclusions to be derived from the figures are few and require no deep analysis. In every instance, if we except the "diastolic stomachs," which constitute only a small proportion of the cases reported, the infant has ingested more fluid at a nursing than the volume of its stomach, as determined by careful measurement, can contain. This means that the figures for gastric capacity, as they are now set forth in the text-books, represent the anatomic capacity of the stomach, but that the physiologic capacity, the amount of milk a child should take at one nursing, is considerably larger than this. Although these children took quantities of milk that at first sight (see table) would seem excessive for the size of their stomachs, they showed no signs of gastric dilatation; and this in spite of the fact that infants of precisely this type, that is to say, children with little bodily strength and power of resistance, within a few weeks of death from marasmus present the most marked predisposition to such a condition. Furthermore they were fed on cow's milk which is much more likely to dilate the stomach than is mother's milk. The amounts of food were regulated according to the child's appetite, no attempt being made to force the feedings, as has been mentioned before. This is borne out by the fact that nearly every infant took the entire amount of milk offered him at a nursing.

The proper amount of food to be given an infant cannot be definitely formulated for all cases. The physiologic capacity of infants' stomachs is at such variance with the anatomic measurements that it is only possible to say that a baby can ingest more than the anatomic size of its stomach would seem to warrant. Thus the physician must feel his way and order the quantity of each nursing according to the conditions of the case. Holt, in his text-book on children's diseases (1908 edition), makes two statements in this connection that may be elucidated by these facts: (p. 205) "The quantity for one feeding cannot always be stated," and (p. 199) "No greater mistake can be made than to attempt to measure the increase of the food by the age of the child."

It may not be amiss to glance over the facts that have recently been brought forward in regard to the mechanism of gastric digestion. They go far toward explaining the above results in a thoroughly rational way.

Shortly after milk has been swallowed, the stomach is found to show signs of motor activity. According to the character of the movements of the gastric wall, two regions may be distinguished. In the first part, comprising the left half of the organ, the movements consist of slow, shallow, peristaltic waves, gently pushing the food lying next to the gastric wall toward the pylorus. This cardiac part of the stomach acts as a reservoir where the food lies undisturbed by any movement except such as is necessary to pass the peripheral layer on to the pyloric half. In the right half of the stomach the state of affairs is different. Here, beginning about five to eight minutes after ingestion, deep peristaltic rings advance toward the pylorus and press the gastric contents strongly against the pyloric valve. The valve opens from time to time and allows some food to pass into the small intestine. When it does not open, the food mass is regurgitated to the left through the next advancing peristaltic ring to be again pushed against the closed pyloric valve by a subsequent peristaltic wave. These waves recur about every ten seconds and require approximately thirty-six seconds to pass from the middle of the stomach to the pyloric valve, so that several waves may be seen passing across the stomach from left to right at the same time. When the stomach becomes filled, the pyloric half—antrum pylori—elongates and is thus enabled to take up more food; as the gastric contents are passed on into the intestine, the antrum pylori returns to its original size. These observations made by Cannon on cats by means of Roentgen rays, confirm the work of a number of investigators in a very conclusive manner.[4, 5]

It is thus shown that the two parts of the stomach have distinct functions—the left or cardiac half acting as a reservoir in which the food lies practically undisturbed until it is passed on to the right or pyloric portion, where, under greater pressure, it is thoroughly mixed and is finally pushed into the small intestine.

Milk curdles a very short time after ingestion. Tobler,[6] investigating a boy with gastric fistula, was able to show that coagulation of the casein begins in two or three minutes and is complete in ten minutes. This process is of great importance, since it is found that the fluid portion, containing the milk sugar in solution, is rapidly expelled from the stomach in the manner described above, while the curd consisting of the casein with the fat entangled in its meshes, remains behind for further digestion.[7, 8] The fluid gastric contents begin to pass through the pylorus before the infant has stopped nursing. It is for this reason that we find the apparent discrepancy between the physiologic and anatomic gastric capacities, the former being considerably larger than the latter.[1, 9] (Table I.)

To say that in the cardiac end of the stomach, acting as a passive reservoir, the food must be in layers according to the order in which it has been swallowed, is as simple as the solution of any puzzle when one knows the answer. Curiously enough, a veterinary, an experimenter in animal physiology, discovered this fact some twenty years before it was accepted or confirmed by clinicians and students of human physiology. On feeding differently colored portions of hay and oats to horses, killing the animals, freezing the stomachs and sawing them into sections, as many as four distinct horizontal layers could be seen.[10] In recent years experiments have been made on various animals, with food materials similar to those consumed by man, and in these instances slightly different results were obtained. After the ingestion of semisolid food such as chewed meat, potatoes, etc., the portions swallowed late during the meal are found to be encapsulated within the material first ingested like a kernel within a nut.[4, 5, 11]

When milk is given in variously colored portions it can be demonstrated that the results are somewhat different. Here, in contrast to what has been stated above in regard to solid or semisolid food, each subsequent feeding layers itself about the earlier ones, and thus the food first ingested may be kept in the stomach indefinitely, if meals are given at too frequent intervals. Hence rational feeding of infants, even more than in the case of adults who take solid food, demands that the stomach should be completely emptied before a second meal is administered. Otherwise, aside from the fact that no period of rest is allowed between nursings, a residual mass remains in the center of the cardiac part of the stomach. This material, not being reached by the hydrochloric acid of the gastric secretion, yields an excess of deleterious fatty acids through unhindered bacterial action.[6, 7]

Knowing the danger of giving too frequent meals, the question naturally presents itself, How long does the infant's stomach require to empty its contents into the small intestine? There are so many factors to consider that a definite answer becomes difficult. However, before a discussion of these matters is entered into, the general rule may be stated that it requires about two hours for milk to pass through the pylorus in the case of breast-fed children, and three hours in the case of those taking cow's milk.[2, 9, 12]

These principles in infant feeding have been successfully applied by W. Caemerer,[12] who has made a close study of the subject. The amount of food taken at each nursing was determined in breast-fed infants by weighing before and after each nursing.

By this means it was shown, just as was demonstrated by a different method in Table I., that the physiologic gastric capacity is greater than that determined anatomically. Combining this knowledge with what is known of the physiologic facts, Caemerer devised a feeding schedule which is more nearly rational than the one commonly employed.

TABLE III.

Age.	Anatomical gastric capacity (Pfaundler).	Size of average meal of breast-fed.	Amount of cow's milk given at one nursing.	Number of feedings in 24 hours.	Interval between nursings.
1 month	90 c.c.	100 c.c.	115 c.c.	7	3
2 months	100 “	130 “	125 “	7	3
3 “	110 “		145 “	6	4
4 “	125 “		145 “	6	4
5 “	140 “	170 “	170 “	6	4

Table III.—Compiled from Pfaundler's[1] and Caemerer's[12] work.

The minimum interval between feedings is three hours, and the amount of milk given is always somewhat larger than the anatomic gastric measurements would indicate. This scheme, according to which infants are fed on a three-hourly schedule from birth, stands in marked contrast to that usually adopted in America, where a beginning is made with a two-hourly interval and a three-hourly one is reached only with the fourth month. And yet it is a generally admitted fact that an infant's stomach requires about three hours to empty itself completely into the intestines. For breast-fed infants an interval of two and one-half hours may be adopted instead of a three-hourly one, since mother's milk passes from the stomach more rapidly than cow's milk.

Knowing what we do of the muscular action of the right and left halves of the stomach, it is only natural to expect that the portion in which the muscles do not contract strongly should have a low intragastric pressure and that where these contractions are vigorous the pressure should be higher.[5] In the cardiac region there is a constant pressure of 8 cm. of water, whereas in the pyloric end the intragastric pressure rises to 20 or 25 cm. during the periods of peristaltic activity.[11] Here we can see one source of error in measuring gastric capacity on the dead subject. It is obviously impossible to reproduce these delicate adjustments of intragastric pressure and the methods employed therefore yield results which are physiologically incorrect.

The cardiac end of the stomach has a very delicate mechanism of its own by means of which it is at times closed, at others open. In cats, after a fluid meal such as starch paste, rhythmical regurgitations of food from the stomach into the esophagus can be seen by means of Roentgen rays. The food is forced back into the gastric cavity by peristaltic contraction. This movement continues as long as the contents of the cardia remain alkaline in reaction; as soon as they become acid, the cardiac orifice closes, the regurgitations cease and are not resumed until the reaction of the neighboring food particles has again grown alkaline.[13] It may be that this chemical reflex action explains the regurgitation of milk in thriving infants, and that this phenomenon may not in every instance be due to excessive meals and overdistention of the stomach.

The pyloric valve acts in a manner directly opposed to that of the cardia. When the material in the antrum pylori is acid the valve opens and vice versa.[5] Thus a correlation is established between the cardiac and pyloric openings. When one is closed the other is open. Acid reaction of the gastric contents thus causes a closure of the cardia resulting in increased pressure, which means of course that food is pushed with greater force toward the pylorus which is about to open. On the other hand, an alkaline reaction resulting in a closed pylorus allows the open cardia to act as a sort of safety valve in case the intragastric pressure grows too great.

Besides this chemical reflex which tends to close the pylorus, there is one other reflex that comes into play on the gastric side of the valve. Solid particles of food may be pushed against the pylorus for a considerable period of time without opening the valve; fluid or well-macerated semisolid food does not experience this difficulty in its passage to the small intestine.[5, 14]

These two reflexes, the chemical as well as the mechanical, affecting the pylorus, furnish at least one explanation why the curd of the milk passes from the stomach at a much slower rate than the fluid portion. The casein combines with much of the free hydrochloric acid and for some time the gastric contents of the pyloric region will exhibit no free acid with which to relax the pyloric valve. Cow's milk, as is well known, forms much larger and tougher curds than does woman's milk. These solid particles must be softened and broken up before they can pass into the small intestine. Since this is more easily accomplished with the smaller, softer casein of woman's milk, it follows that such milk will find an open pyloric valve much more rapidly than cow's milk. This explains the statement previously made that cow's milk requires three hours for gastric digestion while mother's milk remains in the stomach but two hours.

The factors regulating the closure of the pyloric valve on its duodenal side are equally interesting. Here too chemical as well as mechanical influences play their part. Acid reaction of the duodenal contents tends to close the pylorus, while an alkaline reaction has the reverse effect.[5, 14] Since this reflex harmonizes perfectly with the intragastric one described above, it follows that there is forged a complete chain of co-ordination, chemically controlling the cardia and pylorus.

The mere mechanical effect of the presence of food in the duodenum will cause reflex pyloric closure. Thus in animals with a duodenal fistula it is seen that food is passed out of the stomach much more rapidly when the distal loop is empty.[7, 15] In a dog the stomach was found to empty itself in two and one-half hours through a duodenal fistula. However, when the material which had undergone gastric digestion was reinjected into the distal duodenal loop, the period of gastric digestion was lengthened from two and one-half to three and one-half hours.[14] The possibility naturally suggests itself here that the reflex closure of the pylorus is due to nothing more nor less than the acid reaction of the contents. It is easy to meet this objection by substituting an inflated rubber bag in the distal duodenal loop, when it is noted that the more tightly the bag is inflated, the longer does the pyloric valve remain closed.[14]

It is thus seen that a second nursing following close upon a previous one may be delayed in its passage from the stomach on account of the mechanical and chemical reflex action of the contents of the small intestine, in spite of the fact that the stomach is empty. For this reason, if for no other, the interval between nursings ought to be rather longer than the minimal amount of time required for the passage of food from the stomach.

The rate at which different food products leave the stomach varies very much with their quality as well as with their consistency, *i.e.*, it is different for carbohydrates, fats and proteids. Allusion has already been made to the fact that solid masses tend to keep the pyloric valve closed for a considerable length of time. The water and soluble portions pass out of the stomach first. Thus when milk is fed, the fluid part is rapidly passed on into the duodenum while the coagulated casein remains behind as a curdled mass, to be subsequently ejected. A review of the influence exercised by the quality of various foodstuffs on the duration of gastric digestion reveals the fact that carbohydrates pass on most rapidly, fats most slowly. In fact, carbohydrate food leaves the stomach soon after ingestion; proteids require about twice as long a time and fats a still longer period. Thus the differences in the rate of expulsion are by no means negligible, and they deserve serious attention.[3] Fat is the most important constituent of milk in its influence on the motor activity of the stomach. Raising the fat from a small amount (.3 per cent.) to a larger one (6. per cent.) means to lengthen the time required for an infant's stomach to empty itself from 100 to 210 minutes; in other words, to more than double the duration of gastric digestion. This retarding action of fat is effected in two ways: by the inhibition of gastric secretion, thus no acid being furnished to relax the pyloric valve, and by the presence of fat in the duodenum, which will cause reflex closure of the pylorus for a prolonged period.[2]

The dilution of cow's milk is most favorable for rapid gastric digestion when an equal quantity of water has been added. Fifty per cent. cow's milk will leave the stomach faster than dilutions of either a lower or higher percentage.[2] Thus proper dilution of milk plays just as important a rôle in relation to gastric capacity as does the quantity given at one nursing. The infant's stomach is not a mere mechanical receptacle that empties itself of a given amount of food in a given time, but it is found that when the percentage of fats is high and dilution of whole cow's milk diverges from the optimum of 50 per cent., the baby's stomach handles its food less rapidly, and that under such circumstances the physiologic gastric capacity is really much diminished.

SUMMARY.

The gastric capacity of infants as measured postmortem or intravitam is a false guide to the amount of milk that should be offered at each feeding. The quantity of milk given at each nursing should exceed the measured gastric capacity for a child of the corresponding age by a considerable margin. The interval between nursings should never be less than two and one-half hours for breast-fed children, and three hours for bottle-fed. Infants fed according to these principles showed no signs of gastric dilatation during life nor on postmortem examination of 24 cases that died of marasmus.

In infants exhibiting the symptoms of overfeeding the size of each nursing is in many instances not at fault. The cause of such symptoms must also be sought in too short periods between nursings, in the improper dilution of milk and especially in excessive fats.

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DIPHTHERIA "CARRIERS."—Myer Solis-Cohen (*Journal American Medical Association,* January 9, 1909) says that persons coming in contact with a diphtheria patient frequently have virulent Klebs-Loeffler bacilli deposited on their mucous membranes. Such infected "contacts" may later develop diphtheria or, remaining healthy, may act as diphtheria "carriers," transmitting the bacilli to others, who thereupon may develop the disease or may themselves become diphtheria "carriers." To prevent their becoming a source of danger to others, diphtheria "carriers" should be isolated until bacteriologically clean. Recognition of the infected "contacts" must precede their control. This can be brought about only by taking cultures of the throats of all the inmates of a house where diphtheria exists. Little progress need be expected in the prophylaxis of diphtheria so long as we neglect the animate carrier of the contagion.—*American Journal of Obstetrics.*

ON THE SO-CALLED "CASEIN MASSES" IN INFANT'S STOOLS.

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For many years the so-called "casein masses," both small and large, seen in infant's stools, which resemble very much in appearance the masses that are formed when milk is coagualted with rennet, were generally considered as the undigested remains of the casein which had been given in the food. But already in the year 1878 Widerhofer,[1] in answer to the question, "Are the masses (the so-called casein masses) really casein or only fat with epithelial remains?" said that Wegscheider had shown in a convincing way in his researches on the digestion of infants that the so-called milk detritus in the feces consisted chiefly of fats with a small amount of another substance, which perhaps was the remains of intestinal epithelium. "In no way," said Widerhofer, after the researches of Wegscheider and of Ludwig, who confirmed Wegschieder's results, "can the milk detritus be considered as casein."

Since then this statement of Widerhofer has been accepted by the leading German pediatrists (Heubner, Czerny, Finkelstein) and confirmed time and time again. Only Biedert and his followers (Selter) have remained of the opinion that these "casein masses" consisted chiefly of the undigested remains of the casein that had been given in the food, together with fat, fatty acids, and alkalies. They based their assertion on the similar appearance that these masses had to casein and, above all, to the positive qualitative proteid reaction of these "casein masses." But how little one is justified in calling these masses casein simply because they give a positive proteid reaction was shown by Adler's[2] thorough researches. With right Adler maintained that substances could not be called casein just because they gave a positive heat, Biuret, Heller and other proteid reactions. Furthermore, all these reactions are given by the nucleoproteids of the intestinal secretion and the nucleoalbumens of the bile. Even the hunger stool and the watery discharges in enterocatarrh of those infants who had received no milk for many days gave a positive proteid reaction. Therefore, a positive proteid reaction does not permit us to call the proteid contained in the masses casein.

A simple observation, which we have often made in our clinic in infants themselves, leads us to the same conclusion. If we give whey to an infant, that is to say a food which contains neither casein nor fat, we often see the typical "casein masses" in the stools. These masses give the proteid reaction and contain fatty acids, soaps and bacteria. But inasmuch as casein has nothing to do with the formation of these masses, the substance which gives the proteid reaction must come from the intestinal secretion, while the fatty acids and soaps are formed from the sugars in the whey.

Lately Selter[3] has endeavored to show by a quantitative nitrogen estimation of these masses that they contain casein. He examined one large "casein mass" and found that it contained 25 per cent. fat, 50 per cent. albumen, and 20 per cent. salts. From this analysis Selter believes that many "casein masses" in the stools are similar in composition to an artificially coagulated casein mass. Langstein said, in answer to Selter, that the above reported analysis made it clearly evident (which fact no one has ever denied) that proteid played a rôle in the formation of these masses, but that this proteid could very well come from the intestinal secretion. Furthermore, it was said that it was highly improbable that such a casein mass should pass through the whole intestinal tract without being digested (Tobler).

A review of the literature in Germany shows that no one has been able to show quantitatively or qualitatively that these so-called "casein masses" really contain casein. Recently two articles have appeared on this subject in America—one by Southworth and Schloss[4] and one by Talbot.[5] Southworth and Schloss have applied the various proteid reactions to the stools as Biedert had done, and Talbot has made quantitative estimations especially of the larger masses similar to Selter. About both methods of examination we have spoken above.

If we bring up the question of these casein masses again it is simply because we wish to show that the conclusions of Biedert and his followers are not justifiable. If one considers the proteid found in the stools as the undigested casein of the food, then the conclusions must follow, which Biedert and his school make, namely, that casein as such causes digestive disturbances.

Observations at the bedside and metabolism analyses speak against these conclusions in a significant way. In our clinic we have never seen a rise in temperature, nor have we seen the stools become dyspeptic, nor have we noticed disturbances in the general condition of our patients from the addition of casein to the feeding. (Sugars and salts we have shown can cause a rise in temperature and other untoward symptoms.) Further, it is often possible, by giving large amounts of casein, to cure mild cases of digestive disturbances which are due to fermentation. The casein causes an increased intestinal secretion (we recall the fact that an infant secretes about 1 liter of intestinal secretion daily), and this alkaline secretion, which is rich in albumen, tends to neutralize the fermentation processes.

Even in the severest disturbances in nutrition, in "Intoxication" (according to Finkelstein's nomenclature), or acute enterocatarrh (Widerhofer) large doses of casein may be given without any bad effects (Finkelstein).

These observations made in our clinic are confirmed by metabolism analyses. How little the nitrogen excretion in the stools depends upon the amount of casein given in the food has been shown in a convincing way by Orgler.[6] Orgler examined the stools of various infants that had been fed on cow's milk, which contains very much nitrogen, and breast milk, which contains very little, and found that the nitrogen in the stools on both feedings was about the same. In 100 grams of dried stool from an infant on breast milk he found 4.02 grams N, while in the same amount of dried stool on cow's milk feeding he found 4.21 grams N. In other words, he showed that the amount of nitrogen that is given in the food has little, if any, influence on the amount of nitrogen in the stools.

Still more clearly is this fact demonstrated by observations which one of us made on an infant which received large amounts of casein. In the first period 4.108 grams N were given in four days and 0.7,108 grams N appeared in the stools—that is to say, 17.3 per cent. of the N that had been given. Next the amount of casein given was markedly increased—42 more grams of casein were added in four days. During this second period

14.206 grams N were given in four days and 0.9,236 G N appeared in the stools—that is to say, 7.2 per cent. of the N that had been given. Although the amount of casein given in the second period was almost four times as much as during the first period, the total amount of nitrogen was only increased by 0.0,525 grams per day.

Still less is the resorption influenced in the following case, which received a much larger addition of casein. 7.686 grams N were given in four days and 0.7,328 grams N appeared in the stools during that time—that is to say, 9.53 per cent. of the amount that had been given. During the next period of four days eighty-four more grams of casein were given—that is, 21 grams more daily. During the second period 19.0,928 grams N were given and only 0.7,028 grams N appeared in the stools—that is to say, 3.78 per cent. of the amount given. Thus, in spite of the enormous increase in the amount of casein in the second period, the amount of N in the stool remained the same as it was before the increase—that is to say, the N in the stool was reduced from 9.53 per cent. in the first period to 3.78 per cent. in the second. Thus one is justified in saying that the amount of nitrogen in the stool has no relation to the nitrogen that is given in the food.

One might say that this only holds good in infants that are well, while in an infant with disturbances in nutrition under the same conditions undigested casein might appear in the stools. But in infants with disturbances in nutrition we have also exact metabolism analyses, as well as our above-mentioned clinical data.

A child, three months of age, that was receiving 800 grams of buttermilk plus 5 per cent. "Soxhlets Liebigszucker" showed the usual symptoms of dyspepsia (elevated temperature, no increase in weight and an increased number of stools in which there were large and small "casein masses"). According to the teaching of Biedert and his followers, from the stool examinations one would have said that the dyspepsia was due to casein and accordingly would have diminished the amount of albumen in the food. But inasmuch as we know from the teachings of Finkelstein that in spite of the presence of casein masses in the stools this picture of dyspepsia is due to the fact that the infant's tolerance for sugar has been overstepped, we diminished the amount of sugar in the feeding (we gave 10 grams instead of 72), while the amount of albumen remained about the same, and after three days was even increased. The result justified our treatment. On the day that the sugar in the food was diminished the casein masses disappeared, one firm stool was passed daily, and the temperature dropped to normal—in a word, the dyspepsia was cured.

We have seen the same result as the above in numerous other cases. Based on similar results, there has lately appeared from our clinic a new method for the treatment of disturbances in nutrition (Finkelstein and Meyer[7]).

Thus it is clear that the appearance of "casein masses" in the stool has no relation to the casein which is given in the food. Furthermore, we can cause these "casein masses" to appear in the stools of infants with nutritional disturbances by giving large amounts of sugars. We shall not go into the question here how this fact is brought about.

What does the metabolism analysis teach us in the above described case where, as was shown, "casein masses" appeared in the stools on a feeding of buttermilk, which contains much albumen, and where, in spite of these "casein masses" the sugar was reduced and the albumen kept about the same?

During the three days of buttermilk feeding 9.072 G N were given and 1.6,509 G N appeared in the stools; that is to say, 18.19 per cent. of the amount of N given. Clearly this result might be explained by poor albumen resorption (increased peristalsis and increased intestinal secretion). In spite of the fact that in the following three days the casein of the feeding was only decreased a little, and in the following three days increased to more than during the buttermilk period, we see the following analysis:—

Amount N given.	Amount N in Stool.	Percentage of N in Stool.
7.602	0.6,714	8.83 per cent.
9.6,765	0.790	8.23 " "

The amount of N in the stool sinks to almost one-third that it was during the buttermilk period. Instead of 18.19 per cent. of the amount given only 8.83 per cent. appears in the stool.

These figures show that the casein of the food could not have caused the large amount of N in the stools, because with about the same amount of casein in the food the resorption of casein becomes normal as soon as the "causa nocens"—the sugar—was diminished.

Thus our clinical observations are confirmed by our N metabolism analyses. It has been shown that the "casein masses," and even an increased N excretion, cannot be considered to be due to a disturbance in proteid digestion.

To summarize:—

(1) The so-called "casein masses" cannot be considered undigested casein.

(2) The N of the feces and the N of the food bear no intimate relation to one another.

(3) The appearance of "casein masses" and even an increased amount of N in the stools do not point to a disturbance in proteid digestion.

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Transmission of Scarlatina by Milk Bottles.—H. B. Wood (*New York Medical Journal,* December 19, 1908) reports an epidemic of 16 cases of scarlet fever in 13 families, all persons infected using milk from the same dairy. No cases could be located at either of the farms supplying the latter or at the dairy. All milk was bottled at the dairy, the bottles being simply washed with warm water. When their sterilization was begun the epidemic ceased. In a milk epidemic an explosive onset indicates rather an infected general supply; a germ carrier in the dairy would be more apt to give an epidemic of longer duration, considering the number of infected persons, and without intervals of quiet before the early cases. The daily returning of infected bottles from one household accounts for the more rapid later development of this epidemic. The results of sterilization add weight to the bottle hypothesis. Such results show the necessity of at once controlling avenues of bacterial escape, the danger of permitting bottles to go from any household where illness occurs among children, the value of habitual sterilization by both householder and dairyman, and the necessity of competent sanitary officers with legal authority.—*American Journal of Obstetrics.*

THE DEVELOPMENT OF DAIRY HYGIENE.

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BY ROWLAND GODFREY FREEMAN, M.D.,
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President's Address.

At the Third Annual Meeting of the American Association of Medical Milk Commissions, Atlantic City, June 7, 1909.

Enthusiasm for improvement in dairy hygiene is the source of the large attendance at our meeting, and it is this alone that brings to our annual sessions delegates from all parts of the country. This enthusiasm is brought about by our hope, through better conditions, of obliterating the fatal results of dirty dairy methods.

I have been in the habit of dating dairy hygiene in this country from the time of Coit, and I have done this without a very exact knowledge of what had been attempted or accomplished in earlier times. A recent article by Hanauer gives us some idea of this development up to the middle of the last century, and from this I am quoting freely in what follows.

Going back to the early records we find reference to milk as a food, but little evidence of an appreciation of its dangers.

The Bible refers to the land of Canaan as a land flowing with milk and honey, and again in Ezek. xxv. 4 it is threatened that the men of the East will come and "drink thy milk"; in Deut. xxxii. 14 "the butter of kine and the milk of sheep" was referred to; in Prov. xxvii. 27, "And thou shalt have goat's milk enough for thy food, for the food of thy household, and for the maintenance for thy maidens."

In Greek and Roman literature there are references to cow's milk, the milk of sheep and goats, also mares, the latter being used fermented.

During the middle ages there did not exist the milk trade as at present, for people lived in small communities, where they for the most part produced themselves their own supplies and kept either a cow or a goat as a source of their milk.

One of the earliest records of the appreciation of the dangers that may exist in the consumption of milk occurred in Venice in 1599, where the Senate, on account of a serious epidemic, forbade, under penalty of death, the sale or use of butter, milk or cheese.

Again in 1682 an edict was issued that on account of an epidemic among cows the milk should be poured on the ground and buried. And again in Braunschweig-Luneburgische, in 1732, there was an edict to the same effect, which also states that the milk from these cows was of a yellowish-red color or with yellowish-red streaks.

Perhaps the first indication of the sort of cleanliness of milk and dairies which we consider essential for the production of safe milk is contained in an encyclopedia published in 1739. This states that "milk from old cows or cows produced for beef is not good; that good milk must be either white or yellow, not green or blue; that the cows must not only be fed but must be given clean straw; that the milkmaids must not only keep themselves clean but also the utensils, and that after milking the milk should be filtered through a cloth, and it also states that milk produced in an uncleanly manner will easily become sour.

A test for milk was to allow a drop to fall on the finger nail, where it must remain round and not immediately flow off.

A milk ordinance in Paris in 1742 regulates the feeding of animals used for milk production, including cows, goats and asses. Spoiled malt is interdicted and the use of any poisonous food, while the milk dealers were forbidden to sell milk that was watered or colored with eggs, or that was sour or injurious to the health.

The first reference to the relationship of milk to infant mortality is contained in a decree issued in Vienna in 1792, which states that the adulteration of milk is especially injurious to young children and that in the city and its environs a much larger number of children die than should be expected from their general condition.

It is said that the first attempt to put hygiene on a scientific basis was the work of John Peter Frank at the end of the eighteenth century, and he is especially clear and precise in what he has to say about milk and its relation to the health of children. "Milk should not be handled in vessels of zinc, lead, copper or brass; that in Paris, where milk is handled in copper vessels, frequently whole families are poisoned with verdigris." He mentions the influence of bad feeding on milk as denoted by its smell and taste; also through feeding certain noxious weeds to cows. He discusses the stabling of cows and says that those who sell milk should have clean, well-lighted and healthful stables; that they should give the cows fresh feed or pasture them, which latter methods gives the cows healthful exercise. He says that colostral milk should not be sold, nor watered milk which does not contain the nourishment of full milk. Milk should be examined for the addition of meal and the milk of sick cows should not be sold. Frank quotes Timaus von Guldenklee, who mentions a case of a cow who was bitten by a mad dog, stating that the farmer and all those who drank the milk contracted rabies; that eleven persons died, and that only the farmer and his youngest child survived.

The determination of the specific gravity of milk by a lactometer was introduced by a Frenchman, Cadez de Vaux, and was introduced into Germany in 1804, while in England an apparatus devised by Sir Joseph Banks was used for determining the amount of cream. In Vienna, in 1802, the daily examination of milk was undertaken and those adulterating milk were punished.

Although a milk ordinance was introduced in Hamburg in 1818, Nicoli, writing in 1835, complains that most of the milk sold is diluted with water.

A book of some importance, entitled "An Historical Scientific and Practical Essay on Milk as an Article of Human Sustenance, with a Consideration of the Effects Consequent upon the Present Unnatural Methods of Producing it for the Supply of Large Cities," by Robert M. Hartley, was published in New York in 1842. Mr. Hartley, who was a prominent citizen of this city at that time, lost a child who was being artificially fed, and whose death was attributed to the quality of milk used. He in his grief undertook a very considerable investigation of the milk supply of New York, and as a result he published this book of 350 pages.

He found that seven-eighths of the milk sold in New York was from cows fed on distillery slop. The New York milk supply at that time was 60,000 quarts a day, which sold at an average of six cents a quart. The many large distilleries near the city had established stables adjacent to their plants. In the case of one distillery stable, said to house 2,000 head of cattle, the stalls were rented by the proprietor to the owners of the cattle from $4 to $5 a year each and the distillery slop was sold at nine cents a barrel, one barrel being the complete rations of a cow for a day. No other food or water was given to the cows. These stables were dark, dirty, and crowded, and the cows were never removed from the stalls, remaining there until they sickened and died. An existence of sixteen to eighteen months is said to have been the maximum. Their teeth rotted and they are said to have developed one of several diseases.

Mr. Hartley makes a considerable argument for the bringing of milk from good farming districts, thirty to forty miles away, and quotes the experience of Boston in getting milk from Worcester, which is forty miles distant.

This book contains a very full description of a Glasgow dairy plant which had been in existence since 1813, a plant with 100 cows, with a cellar beneath the stable into which the manure was emptied, and where grooming of the cows was practised. Apparently this model farm was very successful.

It was some time after this before much real interest was aroused in our milk supply and dairy conditions. It was not until about 1880 that a real fear of milk as a food became apparent. This followed the discovery of the very large contamination of milk by bacteria; of the many severe epidemics caused by milk and of the large infant mortality during the summer, which was for the most part confined to artificially fed children.

As I have said, the development of dairy hygiene in this country may be dated from the activity of Dr. Coit, who gave us a means not only of controlling milk productions, but also of obtaining scientific investigations of the contamination of milk, and while this scheme was promulgated sixteen years ago we are only now beginning to see a widespread movement for its expansion.

The same movement, however, is taking place in other countries and no better evidence of the importance that this has assumed among thoughtful and scientific people is seen than the important works on milk and its production which have appeared. The first of these, on the "Bacteriology of Milk," by Swithinbank and Newman, was published in England in 1903. This was followed a year ago by the publication by the Marine Hospital Hygienic Laboratory of the large and exhaustive work on "Milk and Its Relation to Public Health," with which we are all familiar and which we must all frequently consult; while there has now just appeared a larger work than any of these, a "Handbuch de Milchkunde, edited by Dr. Paul Sommerfeld. So that the movement, which this Society represents in this country, is widespread among all enlightened communities, but nowhere, I believe, has it attained a greater state of perfection or as widespread interest as it has in this country.

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CLINICAL MEMORANDUM.

REPORT OF A CASE OF SALAAM CONVULSIONS.

BY S. A. AGATSTON, M.D.,
AND
I. GOLDSTEIN, M.D.,
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Case.—M. A., three and one-half years old, male.

Family History.—Father and mother are first cousins. Their physical and mental condition is normal. Grandfather died of tuberculosis of the lungs. Mother has two children; the elder, five and one-half years, perfectly well. She had one miscarriage before last pregnancy.

Previous History.—The child was born prematurely at seven months; presentation cephalic, delivery non-instrumental, duration of labor not exceeding three hours.

Soon after birth the patient developed snuffles, which was treated by regular daily irrigation. Breast-feeding, which was continued for one year, was supplemented by grocery milk from the start. He had had measles. Adenoids were removed at the age of two years. During the first year child never had any convulsions. He sat up at eight months and walked at fourteen months. Eruption of teeth was normal. He has never learned to speak.

Present History.—The present illness began at the age of fourteen months. The mother then noticed that upon awaking the child would get attacks of bowing of the head and trunk. These attacks would recur from eight to ten times daily, but were most marked and most constant after sleep. The child's mentality remained at a standstill. He became irritable. When displeased he would yell and cry, run around the room, jump up and down, and give the general impression of imbecility. At times he would cry and laugh alternately. He sucks his thumb incessantly. His appetite is good. He has very little control over his vesical and anal sphincters. Up to the present time his mentality has not improved.

Physical Examination.—The child is somewhat undersized, weighing 28 pounds, well nourished, head small; occipito-frontal circumference measuring 19 inches. Facies is that of an imbecile. Examination of the lungs, heart, liver, spleen and kidneys negative. The spine shows a fairly-marked kyphosis, which, apparently, is due to weakness of the vertebral muscles. Examination of the eyes shows a normal fundus in both.

His attacks of salaam convulsions come on without any premonitory symptoms, whether he be standing or sitting. There is a sudden bowing of the head, the chin touching the sternum; simultaneous with this there is an inclination of the trunk forward to the angle of about 60° when in sitting posture; moreover, the right arm, partially flexed at the elbow, is brought forward, in slight abduction, until it reaches the level of the shoulder, the palm, with fingers extended, pointing downward and inward. When the convulsion occurs while the child is standing he will frequently fall forward, his head striking the floor. During the spasm there seems to be a momentary loss of consciousness. Between the spasms the child appears contented, at times smiling and clasping his hands in apparent joy. Each attack consists of 20 to 30 spasms, each lasting about twenty seconds, at intervals of fifteen to thirty seconds. Toward the end of the attack the spasms are incomplete and may consist of merely a partial bowing of the head.

During the past year, while the case was under our observation, we cannot report any perceptible improvement at any time, or diminution in the number of attacks.

Salaam convulsions, salaam tic, eclampsia nutans, is a condition which was first recognized by Newham in 1849. He reports 4 cases. T. H. Tanner, in his book, gives a description of this condition, based on these 4 cases. The symptoms are chiefly as follows:—

Sudden bow forward several times in succession, the child sometimes falling on his head. The attack occurs especially upon awaking in the morning. The children develop idiocy, sometimes epilepsy, hemiplegia or paraplegia, and gradually waste away. After several months the symptoms may remit, and after two or three years bodily health may be restored.

In 1850 Wilshire and Faber each reported a case. In 1851 a similar case was reported by Bidwell, and in 1863 another one by W. J. Cox. Of recent years the disease does not seem to have attracted much attention. Cases are sometimes found in asylums in connection with imbecility, epilepsy, etc. There appears to be a difference of opinion in regard to the classification of the affection; some observers would place it in the category of spasmus nutans (head nodding), whilst others would call it a form of epilepsy.

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VEGETABLE DECOCTIONS AS DIETETIC AGENTS IN ACUTE INFANTILE GASTROENTERITIS.—Méry-Bruni (*Med. Tydschrift v. Geneeskunde,* 1909). In the dietetic treatment of gastroenteritis, vegetable decoctions have been found valuable as a transition from a water diet to a milk diet. These vegetable decoctions may be prepared as follows: A mixture consisting of 60 grams potatoes, 45 grams carrots, 15 grams turnips, 6 grams split peas and 6 grams beans is boiled for four hours, with 1 litre water, in a covered stew-pan. The mass is then strained, and the fluid thus obtained is again filled up to 1 litre, adding 5 grams common salt. The treatment was carried out in such a way that infants having acute gastroenteritis were at first put on a water diet during one or two days, after which time they received the vegetable decoctions for a number of days, up to one week. After this time gradually increasing quantities of milk were added to the vegetable decoction. Half a teaspoonful to a teaspoonful of rice flour may be added to each 100 grams of the vegetable decoction.

The effect of this treatment in infantile gastroenteritis was a prompt improvement of the stools and a rapid increase in the body weight. Edema appeared in some of the cases, but soon subsided again after the food was modified by mixing the vegetable decoction with milk. This method, the favorable effects of which have been attributed to the high content in sodium chlorid, seems to be worthy of a trial in certain cases of infantile gastroenteritis.—*Medical Review of Reviews.*

EDITORIAL.

THE CENTURY OF THE CHILD.*

We need go no farther than to read the deeply significant article of Dr. Rotch and the extensive discussion of it in this number of the ARCHIVES to realize that widespread in our country are the interests which strive to better the condition of children and improve the men and women of the future. And if we glance over the pediatric literature of the last few years we must observe that into the vast mass of strictly scientific writing there have been creeping oftener and oftener articles which show that the pediatrician is awake to the sociologic problems which face him as an expert in the development and care of the child. To some, the specialty of pediatrics seems narrow, embracing in its pathologic aspects relatively few disease conditions; and having somewhat simpler problems than the practice of internal medicine among adults. To some, these relatively few conditions seem ample because of the many problems which have not been worked out so well in children as in their elders. To both of these classes of men, the sociologic problems appeal less than to those who see in the practice of pediatrics a field of the widest endeavor in that medicine of the future, the prevention of disease. It is the course of evolution that the pure science of to-day shall become the industrial technique of to-morrow; and the great scientific advances of the last thirty years in the domain of pediatrics must logically develop into the basis for making larger, stronger, healthier children, and larger, stronger, healthier citizens for the State.

The man of letters long ago entered the field of reforms in the child's conduct of life, and the childhood of the present generation of physicians became familiar with tales of school abuses, and child workers in the mines and mills of England through the writings of Charles Dickens and his contemporaries. Nowadays scarcely a magazine but contains some more or less authentic article upon conditions in child life which need reforming.

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* "The Century of the Child." By Ellen Key. 1909. New York and London: G. P. Putnam's Sons.

The physician, with characteristic conservatism, has been slow to enter the field, but with his training he enters it fully equipped and can coöperate effectively with the many child labor organizations, school inspection movements, endeavors for the prevention of blindness, and reforms in the time and manner of educating children, which are now so well known and so universal.

In the homely old matter of "rearing children" there has been progress and evolution, and in the process considerable hyperplastic growth. The science which reformed the haphazard habits and feeding methods of earlier generations, whose simpler lives made them able to withstand irregularities to which our children would succumb, has often strayed beyond into various schemes for communal education and upbringing, which were somewhat the result of higher education for women and the movement for woman's suffrage.

Whether or not these extremes are wise, and whether the education of children will continue to develop away from the old-fashioned home life cannot now be determined. Certain it is, however, that as under newer ideals of sanitation public health has improved, so with greater thought given to the problem of the child will develop the greater man of the future.

Mrs. Key's book deals with just this problem of the proper and unrestricted development of the child in this his century. The child's right to healthy parents; to a sound body; to a suitable home; to a rational development of his own individuality; to an education which shall fit him for his struggle for existence, and which shall leave him still capable of holding fast to, and seeking higher ideals; to a freedom from occupation which may maim, cripple or deform him, in soul or in body, Mrs. Key discusses with vigor, directness and truth. It is not the dogmatic teaching of the past we find here, but an enlightened onward-looking philosophy, which embraces all the progressive movements of the day; and which, reviewing the wrongs done against childhood, whether of the well-to-do or of the squalid poor, sees for each wrong the moral defect in society which causes it and attacks that defect with the knowledge that "when the child gets his rights morality will be perfected."

We recommend to anyone who thinks pediatrics a narrow field that he read "The Century of the Child" and then try to trace the limitations of its practice.

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY
DR. T. WOOD CLARKE. DR. CHARLES OGLIVY.
DR. C. D. MARTINETTI. DR. M. C. PEASE, JR.
DR. G. R. PISEK.

DISEASES OF EAR, NOSE AND THROAT.

WISHART, D. J.: DATE STONE IN TRACHEA—LARYNGEAL PARALYSIS—REPORT OF CASES. (*The Canadian Journal of Medicine and Surgery*, July, 1909, p. 27.)

Dr. Wishart reports 2 interesting cases; one of a date stone in the larynx, and the other laryngeal paralysis following diphtheria. The first case came to the hospital with no history, but there was a severe and increasing dyspnea, marked tracheal tugging, and the usual symptoms of laryngeal obstruction. A tracheotomy was done, and an expulsive cough brought through the wound a date stone three-quarters of an inch long and one-quarter of an inch in diameter, and the breathing was croupy for forty-eight hours, and then the typical rash of scarlatina developed.

The case of laryngeal paralysis occurred in a child who two months previously had had a severe attack of diphtheria, during which an intubation was done. At this time, after a cold, the dyspnea was such as to demand intubation. A month later the child nearly died from laryngeal spasm, and, owing to the fact that even the smallest tube could not be inserted, the trachea was opened. During the next five months the child was intubated repeatedly, and twice it was necessary to do a tracheotomy, because the laryngeal spasm would not allow even the smallest tube to be passed. A year after the attack of diphtheria both cords were deficient in abduction, and in deep inspiration assumed the cadaveric position. M. C. PEASE, JR.

PATHOLOGY.

CONSIGLIO, LUIGI: THE ALBUMEN IN BREAST MILK IN RELATION TO ECZEMA IN THE INFANT. (*Rivista di Clin. Ped.*, July, 1909.)

Consiglio has had under observation five infants, breast-fed, all of whom were affected with dry eczema. The mothers were young and healthy. He has found that not only the quantity of fat ingested in the milk was, as expected, deficient, but that the milk contained only half the normal quantity of albumen. Upon changing to diet rich in albumen improvement promptly followed.

C. D. MARTINETTI.

GRECO, C. M.: ON THE RELATION OF CaO IN BREAST MILK AND HEMOGLOBIN IN THE INFANT. (*La Pediatria,* August, 1909.)

Greco has observed numerous nursing women and numerous infants. His researches cast light on a subject hitherto neglected. He finds that the quantity of calcium oxide in breast milk appears to bear a definite relation to the hemoglobin count of infants. He finds that a high percentage of the salt is followed by a high blood count and *vice versa.* Further study reveals that the calcium present is derived almost entirely from the nurse's own organism, and is not increased by ingestion of calcium. In many obscure disorders of infancy breast milk should be examined for CaO.

C. D. MARTINETTI.

FRANCIONI, CARLO: RECENT THEORIES OF THE ACTION OF DIPHTHERIA ANTITOXIN. (*Rivista di Clin. Ped.,* August, 1909.)

Francioni remarks that from time to time various writers have complained about the inefficiency in many cases of antitoxin. Has examined 63 fatal cases, of which 11 apparently bear this out. Reviews the various methods of administration, subcutaneously, in the veins directly, in the muscular tissue, in the spinal canal. The latter seems to be desirable in bad cases, and has been followed by him with good results.

C. D. MARTINETTI.

CANNATA, S., AND LUNA, F.: A STUDY OF BACTERIA IN GASTROENTERITIS OF INFANCY. (*La Pediatria,* August, 1909.)

The authors review at length many theories and researches in regard to gastroenteric disorders in infancy. Overmuch importance has been given to the "bacterium coli," which very frequently resides in normal intestines, whilst a large bacterial flora has been overlooked. The patients observed were partly breast fed and partly artificially fed. In all, diarrhea was present with abundant green liquid stools. Fecal matter was obtained through a sterile catheter with all due precaution as to contamination. Cultures were made in plain agar, Cohendy's agar, and Drigalski-Conrad's agar. The results were as follows: (1) The bacterium coli and proteus vulgaris, normally harmless inmates of the bowel, may both become extremely virulent in gastroenteritis of infancy. (2) The virulence increases in virtue of the action of the germs upon each other and upon other germs. (3) This increase in virulence is due to the live germs, to the proteus and toxins. (4) It is possible for a bacterium coli to remain unaltered in the intestine. (5) A bacterium coli taken from normal feces may become virulent placed in contact with other intestinal germs.

C. D. MARTINETTI.

ORTHOPEDIC SURGERY.

BUDDE: THE RADICAL RESECTION OF THE TARSUS AND METATARSUS. (*Deutsch. Zeitsch. für Chirurg.*, 90 Bd., 4-6, H., p. 572.)

The writer discusses the results of removal of one or more bones of the tarsus and metatarsus in cases of diseased bone and presents his own deductions. The results which follow conservative treatment are, he says, by no means bad: 65 per cent. "successful." One must only consider if by radical removal of all diseased tissue (tubercular) a serviceable foot can be preserved. More consideration should be had of the patient's age and condition than of the number of bones to be removed.

KIRSCH: RESULTS OF EXAMINATION OF THE SPINAL COLUMN IN THE SCHOOL CHILDREN OF MAGDEBURG IN 1906-1907. (*Gesunde Jugend viii. Jahrgang,* Heft 5.)

This study was based on an examination of 1,015 children (518 boys, 497 girls). This included all the children, those just beginning their course and those concluding their studies. The writer distinguishes between a habit scoliosis (I. degree) and a fixed scoliosis. The latter he divides into a middle grade (II.) and a very severe grade (III.) The results are tabulated and indexed. Of the whole number 25.7 per cent. showed scoliosis. The percentage of scoliosis increased from 20.7 per cent. in those just beginning their studies to 30.4 per cent. in those finishing their course; (19 per cent. to 21.4 per cent. in boys; 22.3 per cent. to 41.4 per cent. in girls). But when one distinguishes between the habit scoliosis (not fixed) and the fixed scoliosis (structural change) the following percentages result: 7.5 per cent. of the fixed scoliosis already existed in those just entering school; this increased to 8.6 per cent. in those graduating (in girls from 7.8 per cent. to 11.6 per cent., in boys a decrease from 7.2 per cent. to 6 per cent.).

Habit or not fixed scoliosis increased during school life from 13.2 per cent. to 21.8 per cent. (in girls from 14.5 per cent to 29.5 per cent., in boys from 11.8 per cent. to 15.3 per cent.). From this it follows that school scoliosis does not lead with a regularity to severe scoliosis, that more frequently, as a rule, only those children who before entering school show structural change, develop severe scoliotic deformity.

Relative to the treatment it is remarked that for scoliosis of the I. degree the exercising of the shoulders is sufficient. The greater number of those of the II. degree were sufficiently improved by an orthopedic course of corrective exercises, while the III. degree cases need further special orthopedic treatment.

For little children with severe curvature, a bed for maintaining a fixed position is especially recommended.

The importance of the care of the lower classes is emphasized by the writer. The necessary requisites are school doctors to instruct the parents and generous donations for the care of the poor, both from public and private sources.

Charles Ogilvy.

Baginsky, Adolf von: Acute Fibrinous Pneumonia in Children. (*Die Therapie der Gegenwart,* February, 1909, p. 87.)

Dr. Baginsky believes that fibrinous pneumonia (lobar pneumonia) is far more common in children than is generally supposed. To be sure it is not as frequently met with as bronchopneumonia, which so easily follows other diseases as a secondary infection, but yet hardly a week goes by that Baginsky does not see one or more cases in his service, and his discussion is based upon 360 recorded cases, in all of which the pneumococcus was isolated.

The first six months of child life show a relative but not complete immunity, as true fibrinous pneumonia has been observed during the first month. It is true that the ages from two years to ten years show a greater disposition to lobar pneumonia than do the younger children, and of his total of 360 cases 242 occurred between the ages of two and ten years. Probably as a consequence of a more active life lobar pneumonia is more common in boys than in girls, as shown by the fact that 223 boys had pneumonia as against 137 girls.

One attack does not bring about immunity. On the contrary, it seems to increase the disposition to a second or third attack, and often these children are sick with pneumonia many times. An early diagnosis of this disease is frequently difficult and must be made from the external symptoms, as during the first day, and often during the first four or five days no signs are discoverable in the lungs. It seems to be almost a peculiarity of the disease in children that the beginning of consolidation is central, and that it works slowly toward the surface, so that the dullness, the râles, and the bronchial breathing of pneumonia are delayed for hours and sometimes for days. For this reason we must often depend upon the general appearance of the child, the disturbed ratio between the pulse and respiration (2:1 instead of the normal 4:1), and the high continuous fever for our diagnosis. Out of these known symptoms the picture of the disease can be made so complete that the diagnosis is almost certain even though the physical signs fail. M. C. PEASE, JR.

KÖNIG: THE SIGNIFICANCE OF TRAUMATIC JOINT INFLAMMATIONS. (*Berlin Klin. Woch.*, 1908, Nr. 37, S. 1,669.)

König wishes to answer the question of the relationship existing between violent action (traumatism) and joint inflammations. He affirms that inflammatory reaction of this kind cannot be caused by violent action alone, but that along with it there must be some specific infection.

Among 100 cases of acute infection of the hip joint, 12 were proven to be caused by violent action; 28 cases of gonorrheal inflammation were traumatic. Among 566 tubercular hip joint inflammations he found 86 of traumatic origin. Of 720 tubercular knee cases 120 originated from injury. It is noteworthy that the injury is frequently very slight.

CHARLES OGILVY.

MEDICINE.

SMITH, A. D.: SPLENIC ANEMIA OF INFANCY. (*The American Journal of Obstetrics and Diseases of Women and Children*, January, 1909, p. 125.)

The author defines splenic anemia as "a disease of infancy characterized by a high grade anemia, marked polymorphism of the blood, and enlargement of the spleen out of all proportion to the enlargement of the liver." He does not believe that it has any relation to pseudoleukemia (Von Jaksch's) or Hodgkin's disease. The most common age for its occurrence is between nine months and two years. Bad air, improper food, a family predisposition, and syphilis, together or singly, are all supposed at times to play a part in its causation. The specific agent is unknown, but may be found in some form of toxemia, which has perhaps a gastrointestinal origin.

The cases may be assigned to one of three groups: (1) Those cases in which rickets or malnutrition is present. (2) Those cases in which congenital syphilis is present. (3) All other cases. The majority of cases can be placed in the first group, and the next largest group is the second.

Briefly, the pathologic changes are chiefly a chronic splenitis, mainly affecting the pulp, but sometimes invading the malpighian bodies. There appears to be no definite relation between the extent of the splenic changes and the degree of anemia; the fatty degeneration of the liver and other organs is like that occurring in all advanced anemias.

Aside from the enlargement of the spleen and liver, and the usual symptoms of anemia, the diagnosis depends on an examination of the blood. This is typical, showing a chlorotic reduction of red blood cells and hemoglobin, poikilocytes, microcytes and macrocytes, normoblasts, a few megaloblasts, leukocytosis, with an increase in nongranular white blood cells, and myelocytes in small numbers.

It is to be differentiated from simple anemia, pernicious anemia, leukemia, Hodgkin's disease, and sarcoma of the spleen. With the exception of the last two the differential diagnosis depends on the blood examination. Sarcoma can only be diagnosed at the autopsy table, while the general glandular enlargement will usually make a diagnosis of Hodgkin's disease clear.

The prognosis must be guarded. The appearance of a petechial eruption is, as a rule, of ill omen. The degree of splenic enlargement has no bearing on the prognosis, but a low number of red blood cells and a high number of white blood cells indicates a severe condition. "The more polymorphic the blood, the worse is the outlook."

The treatment should look to an improvement of the hygienic surroundings, fresh air, proper food, and care of the gastro-intestinal tract. Fowler's solution (1 drop) four times a day, and syrup of the iodid of iron or peptomanganate are to be given. Cases with rickets should have cod-liver oil and phosphorus. The X-ray should be given a trial, in view of the fact that many of these cases have improved with its use. Dr. Wolff obtained a brilliant result in the only case where the spleen has been removed. M. C. PEASE, JR.

KERR, LEGRAND: SYMPOSIUM ON RHEUMATISM IN CHILDREN. (*The American Journal of Obstetrics and Diseases of Women and Children,* December, 1908, pp. 1,081, 1,085, 1,089.)

Kerr says that up to the present time no diplococci have been isolated which can be classed as the specific organism of rheumatism. The functional capacity of the heart is the earliest evidence of the existence of an acute rheumatism. This capacity can be well estimated (1) by the Herz arm-flexion test, or (2) by noting whether changes in rate or quality of the pulse occur after the administration of one minim of tincture of digitalis to a child seven years old. Heredity is of great importance in diagnosis; rheumatism being of very likely occurrence if one parent is affected and almost a certainty if both are affected.

McClelland cites the opinions of many internists and throat specialists regarding the relationship of rheumatism and tonsillitis. He agrees with Andrew Clark that the tonsils originate troubles considered as rheumatic by the sudden suppression of the tonsillar lymph-cell discharges, the liberation of which is hindered or inhibited by the blocking of the lymph spaces with the products of bacterial life and effete matters undergoing evolution. Total ablation of adenoids and tonsils will remove the source of infection.

Stivers is of the opinion that milk should be the foundation for the nourishment of rheumatic patients. He gives nitrogenous foods and interdicts starches. Light weight woollen underclothes for the entire year and the avoidance of socks and sandals are insisted upon. All cases with increased temperature are kept in bed until all symptoms disappear. He prescribes salicylate of soda, 2 to 6 grains every three hours for two or three days, for a child three years old, and combines this with bicarbonate of soda. Ice or counter irritants over the precordia are ordered for endocardial involvement. Chloroform liniment or oil of gaultheria is applied to inflamed joints, or 12 per cent. iodoform in collodion and in addition he swathes them in cotton.

For chronic cases potassium iodid, 5 to 10 grains per day, with wine of colchicum sufficient to move the bowels, is recommended. G. R. PISEK.

RUSSELL, J. S. R.: THE VALUE OF REFLEXES IN DIAGNOSIS. (*The Canadian Journal of Medicine and Surgery,* November, 1908, p. 266.)

Russell calls attention to the occasional occurrence of a special alteration of the knee jerk in chorea, in which the knee remains suspended in mid-air too long in response to a blow on the patellar tendon. An absent knee jerk in sore throat cases suggests a diphtheritic infection. A urinary examination should always be made when the knee jerk is lost, as a glycosuria may be the cause. The knee jerk is also lost in many pneumonia cases where the organism is the diplococcus or the Klebs-Loeffler bacillus; in septic pneumonias there is no change in the patellar reflex; when the tubercle bacillus is the cause of the pneumonia the reflex is exaggerated. G. R. PISEK.

THERAPEUTICS.

RAMACCI, A.: PROTARGOL INTERNALLY IN PEDIATRICS. (*La Pediatria,* August, 1909.)

Ramacci has studied the action of protargol in 15 cases of acute enteritis in children. The dosage was from 1 cg. to 50 cg. in water before meals, and never caused intolerance. Patients were placed on water diet. The author had tried all the means at his disposal (bismuth, lactic and hydrochloric acid, quinin tannate) in several of the cases without effect and improvement followed the protargol. Whilst firmly convinced that diet alone is usually sufficient to cure gastroenteric disorders, Ramacci considers protargol a valuable aid, particularly in view of its solubility. C. D. MARTINETTI.

INFANT FEEDING.

CLARKE, T. WOOD: GASTRIC DIGESTION IN INFANTS. A REVIEW OF THE LITERATURE. (*American Journal of the Medical Sciences,* May, 1909, p. 674.)

Investigation into the chemical and physiologic processes of infant gastric digestion may be divided chronologically into the periods before and since the use of the stomach tube. Those of value belong to the second period, introduced by Epstein in 1880. The results of investigations have been, to a certain extent, contradictory, but a few facts seem to be established. Practically all the factors of adult digestion are present, but in a weaker form. The newborn child on breast milk empties its stomach in from one to two hours. The motility is more rapid in the breast-fed children than with children on cow's milk, and in the healthy than in the ill. The acidity immediately after a meal is *nil,* but steadily increases during digestion, less rapidly the younger the child. The appearance of free hydrochloric acid after a diet of barley occurs in a few minutes; after milk only after an hour or more, due to the power of casein to absorb or combine with the acid. Free hydrochloric does not appear until enough acid has been secreted for complete digestion of the protein present. The free acid appears later in disease than in health. In cases of pylorospasm the acidity is increased. Opinions differ as to the occurrence of lactic and volatile fatty acids. Part of the acidity may be due to fat-splitting enzymes. Pepsin is present at all ages and in health and disease. Peptic digestion goes on to the stage of peptones but not beyond that. Rennin occurs in the stomach after the first few weeks of life; whether during the first week is a moot question. T. WOOD CLARKE.

CLARKE, T. WOOD: THE EFFECT OF CERTAIN SO-CALLED MILK MODIFIERS ON THE GASTRIC DIGESTION OF INFANTS. (*American Journal of the American Sciences,* June, 1909, p. 872.)

A series of investigations were carried on at the Rockefeller Institute. The purpose of these was to ascertain, if possible, the exact action of lime water, barley water and sodium citrate upon the gastric digestion of young infants, to learn to what extent the gastric digestion of chronic vomiting infants differed from the normal and to find a test diet satisfactory for the young infant, in order to place the feeding of vomiting children on a less empirical and more scientific basis, especially with reference to the use of the modifiers.

Various test feedings were administered to healthy and ill infants, and the stomach contents later removed by a special lavage apparatus devised by the author and examined. Each child was carried through a series of test feedings, each containing a different modifier, thereby individual variations being eliminated as far as possible.

It was found that the motility of the stomach is in inverse proportion to the concentration of the food. The greater the dilution of the milk the more rapidly the organ empties itself. Lime water does not reduce the acidity of the gastric contents, the neutralizing of a portion of the acid being overcome by an increased stimulation of hydrochloric acid by the gastric glands. This may even increase the amount of acid available for digestion. Sodium citrate acts on the acid in the stomach, converting it into sodium chlorid, and thus markedly reduces the "available hydrochloric acid." Barley water seems to have no constant effect upon the chemistry of gastric digestion in the infant. The type of infants who vomit persistently may be divided into two classes —hypoacidity and hyperacidity. Test feeding should be given to this type of infants to determine to which class they belong. A five per cent. milk sugar solution seems to be the most satisfactory feeding to determine fine differences in the gastric contents. This may be followed by a mixture of milk one part, water two parts, to determine to what extent the gastric glands are capable of responding to stimuli. For the lactose solution thirty minutes is the most satisfactory time to allow the feeding to remain in the stomach; for the milk mixture sixty minutes. On purely theoretical grounds it would appear that when the acidity is low either small doses of alkalies or of hydrochloric acid are indicated, while in hyperacidity sodium citrate holds out the best hope of benefit. Protein digestion in the infant's stomach is slight and is proportional to the amount of hydrochloric acid in the organ.

The value of an accurate knowledge of the gastric acidity in the infant is especially great in the early diagnosis of cases of pylorospasm, in which the hyperacidity may be the first and only symptom. It is possible that the action of sodium citrate in preventing clotting in the stomach is due to its using up all the hydrochloric acid rather than to an abstraction of calcium as usually described.

T. WOOD CLARKE.

ZAHORSKY, JOHN: EXAMINATION OF THE STOOLS OF INFANTS. (*Interstate Medical Journal,* December, 1908, p. 936.)

Zahorsky says that curds of soaps and of casein can be differentiated by the following tests: (1) Soap curds are more granular and are easily crushed with a spatula; casein curds cannot be. (2) Casein curds become tough and leathery when placed in formalin for several hours; soap curds are but slightly affected. (3) Calcium soap is almost completely soluble in a solution of 10 per cent. hydrochloric acid in absolute alcohol; casein curd is not affected. (4) Tincture of iodin acting for ten minutes stains both curds brown, but when washed thoroughly with absolute alcohol the soap curd is almost decolorized; the casein curd is not. (5) Carbol-fuchsin stains both intensely, but decolorizing agents remove most of the stain from the soap curd; the color is removed with difficulty from the casein curd.

A yellow stool owes its color to bilirubin, which can be removed by shaking with chloroform. Green pigment of green stools is not dissolved by chloroform; absolute alcohol acidulated with hydrochloric acid dissolves this green pigment, hence it is probably biliverdin. The change of a slightly green stool on standing to an intensely green stool is probably not chiefly dependent on the activity of the micro-organisms. A clay-colored stool is reduced by bacterial action to the colorless hydrobilirubin. Stools containing hydrobilirubin are rarely found in any but bottle-fed babies, and this pigment results when the proteid matter of the intestinal content undergoes bacterial decomposition, which is a reduction process not an oxidation. Hence if the process of reduction be hindered, for example, hurrying the intestinal content along by a dose of calomel or castor oil, a yellow or green stool results.

Light-colored stools of acholia may be differentiated from those of the milk indigestion by Schmidt's sublimate test, *i.e.,* a red discoloration occurs when a strong solution of bichlorid of mercury comes in contact with a fresh stool containing hydrobilirubin.

G. R. PISEK.

BOOK REVIEWS. 799

Tuberculosis a Preventable and Curable Disease: Modern Methods for the Solution of the Tuberculosis Problem. By S. Adolphus Knopf, M.D., Professor of Phthisio-Therapy at the New York Post-Graduate Medical School and Hospital; Associate Director of the Clinic for Pulmonary Diseases of the Health Department; Attending Physician to the Riverside Sanatorium for Consumptives, of the City of New York, etc. Pp. 394. New York: Moffat, Yard and Company, 1909.

The title of this book explains admirably its purpose, which is to afford to every one, physician, administrator, patient and layman, a comprehensive and accurate knowledge of tuberculosis, its dangers, its curability, its treatment at home and at sanatoria. The book is well printed, attractively bound and abundantly illustrated. It brings together a great amount of information in a clearly written, convenient volume.

Functional Nervous Disorders in Childhood. By Leonard G. Guthrie, M.A., M.D., F.R.C.P., Senior Physician to Paddington Green Children's Hospital; Physician to the Hospital for Epilepsy and Paralysis, Maida Vale. Pp. 300. London: Oxford University Press, 1907.

This book displays much clinical experience and wide reading on the part of the author. From the fact that it is recast from lectures, it acquires a style which is readable and interesting. The author disclaims all pretensions to scientific treatment of his subject, but this must not be taken as an indication that the book is in any sense hastily or carelessly written. It is, on the contrary, full of common sense suggestions and stimulates to thought. The mental growth of the child and his tendencies toward neuroticism are dealt with at length, the different disorders being discussed often from very fresh and novel standpoints. The contributing factor of neurotic parents and attendants, the allowance necessary in the treatment of nervous children, their tendencies toward immoral practices, the results of "cramming" and intellectual precocity are all carefully considered. A careful study of the book should help restore the intellectual common sense of the physician who in the endeavor to bring the lives of his little patients into order and regularity has come to regard children as plastic material with mental peculiarities which may be disregarded and whose best future may be secured by forcing them into what seems to be the most proper channel for the majority.

An interesting minor point in the book is the author's belief that painful dentition is the result and not the cause of intestinal disturbance, and his opposition to interference with the eruption of teeth.

MANUAL OF THE DISEASES OF THE EYE FOR STUDENTS AND GENERAL PRACTITIONERS. By CHARLES H. MAY, M.D., Chief of Clinic and Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department of Columbia University, New York; Attending Ophthalmic Surgeon to Mt. Sinai Hospital, New York. Sixth Edition, revised, with 362 original illustrations. Pp. 391. New York: William Wood and Co., 1909.

Having gone through five American editions and various foreign translations, Dr. May's manual appears in its sixth edition carefully revised. It has always been a model of clearness, very instructive and wonderfully well illustrated, all of which qualities the present edition preserves.

THE REFLEXES IN INFANCY AND CHILDHOOD.—By Dr. Bychowski (*Deutsch. Zeitschrift für Nervenheilkunde,* Vol. XXXIV., 1908). The examination of the reflexes in children under one year of age showed the constant presence of the patellar reflex, which is more marked, as a rule, than in adults. The Achilles tendon reflex, on the other hand, was found to be practically always absent during the first half of the first year, becoming more frequent in the second half, until it is fairly constant about the beginning of the second year. The abdomino-parietal reflex likewise is not congenital, appearing gradually in the course of the first year of life. The cremaster-reflex is often absent up to the fourth or fifth month, after which time it is active and constant. Babinski's reflex preserves the spinal type in the first periods of life (first and second year), during which time it is positive. About the beginning of the second year it undergoes transformation from the spinal into the cerebral type, and disappears.—*Post-Graduate.*

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ORIGINAL COMMUNICATIONS.

AN ABSTRACT OF FINKELSTEIN'S VIEW OF INFANTILE ALIMENTARY INTOXICATION.*

BY IRVING M. SNOW, M.D.,

Clinical Professor of Diseases of Children, University of Buffalo, N. Y.

Finkelstein, of Berlin, has recently published in the *Jahrbuch für Kinderheilkunde* a most interesting series of articles upon alimentary intoxications in infants. They have unfortunately attracted but little attention in the English-speaking world and the writer believes it would be of value to American physicians to have a condensed translation of Finkelstein's views. His ideas upon the etiology and also the cure of the gastrointestinal diseases of babies are those of the modern school of German pediatrists and are at variance with the accepted views of American authors. Finkelstein's theories are revolutionary, but are apparently clearly proven. He demonstrates his points by condensed histories of cases and by charts showing the reaction of weight, temperature and stools to various foods—breast milk, whole milk, skim milk, top milk, buttermilk and carbohydrate gruels. He believes that the digestive troubles of babies are more frequently due to perverted metabolism and to the toxic effect of food elements, fats and carbohydrates, than to bacterial infection. He calls the familiar infantile troubles intoxications and asserts he is able to show that not only faulty development, vomiting and diarrhea, but also more serious toxic signs—fever, cerebral disturbances, excitement and somnolence, choleraic and typhoid symptoms—may be due to diseased perverted processes of nutrition. The effects of food elements upon the digestion are studied as we watch the effect of medicines. He is able to produce symptoms and also to relieve them by increasing or reducing fats and carbohydrates. Casein, instead of being difficult of digestion, is important, easily assimilated and never causes serious symptoms.

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* Read by title before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 28, 1909.

Finkelstein is convinced of the unity of nutritional disturbances. Alimentary intoxication is the highest grade of a primary disturbance which progresses in an unbroken chain from health to the final catastrophe. All the different maladies, fermental diarrheas, ileocolitis, cholera infantum, acute and chronic dyspepsia and marasmus are only subdivisions of digestive disturbance of function, which, according to their intensity, produce various symptom-complexes. One phase passes into another and all are caused to advance or recede by alimentary influence. Cases may present similar symptoms, but with the same treatment wide diversity is seen. With 3 children on the same food suffering from dyspepsia one is quickly cured, one recovers slowly, and a third falls into great danger from an acute attack of a choleraic diarrhea. A clear and vivid description of alimentary intoxication is given. The nervous symptoms are especially emphasized. The child may be crying and restless or may be somnolent, or even comatose. The respiratory changes are constant and often confusing. The breathing is quick and deep and audible. In severe cases it is panting, grunting and very rapid, simulating a pneumonia. The temperature may be insignificant, moderate or dangerously high. There may be dyspeptic stools, moderate diarrhea or violent vomiting, purging or loss in weight. A leukocytosis from infiltration of the intestinal walls from the toxemia, albuminuria and casts and an alimentary glycosuria are mentioned by Finkelstein as nearly constant symptoms. The sugar in the urine disappears with a water diet. In another type of intoxication the gastrointestinal symptoms are mild, but the patient is apathetic or even unconscious. Too much attention is usually paid to the gastrointestinal symptoms and too little to the constitutional and nervous disturbances. The local digestive symptoms are often no index to the danger. The most severe intoxications may appear with a slight dyspepsia or normal stools. The deep, rapid breathing, apathy or restlessness and glycosuria are the most trustworthy signs of intoxication. Regarding food injuries 3 illustrative cases are cited. Two children who invariably reacted on cow's milk with fever and bloody, mucous stools, and a third who sickened on malt soup. In all 3 the signs of intoxication quickly disappeared on a water diet. There was a close association between the giving of food and intoxication symptoms. If we investigate what changes in the nourishment seem to lead to the development of an intoxication, we find that there is a relationship between the quantity as well as the kind of food. In the presence of a disturbed digestion a change for the worse will occur if the quantity of food is suddenly increased. Finkelstein, after numerous experiments in his institution, succeeded in absolutely preventing the occurrence of intoxication. It was possible to avoid the impending danger by lowering the amount of food. He was also able, by increasing the food, to experimentally produce an intoxication. *Example.*—With 2 children in the preliminary stages of an intoxication the food was increased and a catastrophe followed. The toxic symptoms were quickly relieved by the complete withdrawal of food and the administration of water and unsweetened tea. In one the cure was complete by crisis in twenty-four hours. With the other the detoxication was less rapid, yet it surely followed with a fall in temperature. In the case of incurably sick children the effect of starvation is "nil." Yet these cases could be proved to belong to the same pathologic group as the 2 more benign types. After complete detoxication a relapse may occur from an unwise increase of food. The nourishment should be increased gram by gram, with careful observation of weight, temperature and number of stools. In severe cases he gave tea for days with 5 c.c. of food from five to ten times daily. The food is not increased until the urine is free from sugar. The increase or diminution of food must be adjusted to each case, according to its severity. In slight intoxications a fair amount may be given. In fully developed intoxications or in atrophic children very small quantities should be used. The effective dose is always under physiologic need.

RELATIONS BETWEEN THE INTOXICATIONS AND THE KIND OF FOOD.

The effect of food elements can be tested by adding or subtracting them from the diet and observing the reaction. The result of the additional increase of sugar of any kind is to precipitate the outbreak of the intoxication and its diminution or withdrawal is to cause a disappearance of symptoms. Foods rich in sugars, especially the much lauded buttermilk, are dangerous. The number of intoxications in Finkelstein's institution has steadily sunk with the careful use of sugar and a relapse in convalescence is usually attributed to too much sugar. Detoxication is delayed or prevented when much sugar is added to the water. Proprietary foods may cause intoxication in proportion to their amount of soluble carbohydrates. Thin cereal gruels have no pathologic effect. Fat is a food element whose ingestion has a striking effect on intoxication symptoms. Numerous personal experiments show that if the existing tolerance of fats is exceeded, mild disturbances develop into complete intoxication. If the child be already sick it is made worse or a relapse is excited. Even slight quantities of fat may cause serious symptoms. The author states that during an intoxication the toxic quality of fat depends on the patient's susceptibility to fat and not to the intestinal flora. With children whose intoxication is due to severe milk injury fat is especially toxic. It is of great practical importance to foresee the effects of human milk in a sick child. Wiederhofer states that many cases of cholera infantum will not stand breast milk. Salge has shown how common a fat injury is in intestinal catarrh. Breast milk is injurious from its fat. If fat free it will be tolerated. If an intoxicated baby takes large quantities of breast milk the cure is much slower than if put on a water diet. In a second phase of disease the breast milk first increases the trouble, then follows a slow improvement. In a third class breast milk may hasten a fatal termination. Centrifugal breast milk can be given in large quantities with good effect except in almost total destruction of the digestive functions. Its curative properties reside in part free of fat and sugar. The opinion is erroneous that an intoxicated baby that cannot tolerate breast milk will die. Most of these children will improve if given a day on water and then small quantities of food. This method will cause the most astonishing cures in desperate cases. In contrast to sugar, fat increases the intoxication only when the process is active. At other times fat may be injurious, but not in the way of causing an intoxication. With children fed on diluted, whole or top milk mixtures with little sugar the severe disturbances are of the nature of atrophy and not intoxication.

RELATION OF SKIM MILK TO INTOXICATION.

If skim milk is given relief does not follow as quickly as with water. Fever should always be allowed to subside before skim milk is given. Skim milk, however, will seldom make a child worse. Skim milk consists of casein and whey. Experiments show that casein can be given mixed with water during an intoxication with as rapid relief as with water. Albumin is equally harmless. Whey, on account of its sugar, is a bad substitute for casein and has about the same effect as skim milk.

DEPENDENCE OF THE SYMPTOMS UPON THE CONDITION OF THE CHILD.

One child recovering from an intoxication will tolerate a food while the same thing makes another worse. The severity and the acuteness of the intoxication symptoms give no conclusion as to the severity of the blow to the organism. It is surprising how one case will resist therapy while another with the most violent symptoms will rapidly improve. The explanation of this variation is in functional tolerance. The nearer the child is to atrophy the more unfortunate is the occurrence of an intoxication. Up to a certain point we can control the appearance and disappearance of intoxication by dietetics. Continual progress of the original injury is in great part due to faulty diet. In times past many of his patients have suffered from lack of judgment in feeding. Possessed by the idea of the prevailing teaching that severe and feverish disease was due to bacteria and that the case needed abundant nourishment to offset the effects of the infection, Finkelstein allowed children to take food at will, and did not understand that the withdrawal of food and limitation of food constituents was the only way to save. He thinks that his sad experience with chronic, feverish and diarrheal conditions was due to alimentary intoxicants and should have been cut short by correct dietetics. These conditions should be properly studied by a chart with curves of temperature, weight and stools, as influenced by the kind of food.

Apparently accidental changes are the direct result of feeding. The clear association between quantity and kind of food and the rise and fall of the intoxication make it impossible to retain the idea that acute, feverish, toxic aggravations of a disturbed nutrition are the result of an accidental infection. If infections are the cause, how is it, during a whole year with improved dietetics, intoxications in nutritional disorders have been completely suppressed? With certain diets no intoxications occur; with others they are very common. As to the question whether spoiled milk causes the trouble, if one remembers that woman's milk will cause the most severe symptoms, and that our observations have been made in an institution where the nourishment is absolutely free from suspicion, and that of numerous infants, all fed alike, only one child would be intoxicated, the belief will disappear that infected milk will cause intoxication. Intoxications of alimentary origin will appear when a sick child is given larger quantities of food or of certain food elements than its already injured functions can tolerate. Contrary to the prevailing teaching, casein does *not* cause intoxication. Fat and sugar are the causes of intoxication. Detoxication is only possible by excluding fat and sugar. The malady yields as slowly on whey as on skim milk, and the cases improve on casein and water as rapidly as on water alone. The study of appropriate cases shows that the toxic effect of fat is seen only in cases where the organism is badly damaged in a specific way from other causes, usually by a sugar injury. The laxative effect of sugar is well known. From now on it must be counted as the cause of severe and often fatal toxemia. This dangerous property exists in all kinds of sugar. The difference in various sugars requires further study. The effects of mineral salts in milk are not known. It may be urged as an objection to the theory of the alimentary nature of the symptoms of intoxication, that some cases are not benefited by the withdrawal of food. There is a stage in functional injury when even without the addition of more toxic material to the body it is incapable of detoxication or excretion of the existing poisons. The child dies before improvement can occur. An infectious complication may also exist, which may cause fever and hinder a recovery. The poison of the intoxication does not come from bacterial decomposition of the intestinal contents, but from disturbed metabolism. From this standpoint it is conceivable that in the most severe cases, not only the intestines are injured by the food elements, but also the body reserves of fat and glycogen are affected, and that the alimentary intoxication is a true autointoxication. Alimentary intoxication has been compared to an acid intoxication; however, starvation, which causes an acidosis, relieves intoxication. Fat and sugar will cause symptoms of intoxication. The malady is caused by certain food elements, which are given in greater quantities than can be consumed by the diseased organism. The idea should be emphasized that food may have poisonous effects without bacterial infections.

There is an alimentary fever, and the teaching of the older physicians as to the heating effects of food and the starvation diet of fevers rests on facts. Food becomes a poison only when the metabolism is severely injured. The intoxication is only a transitory symptom, which brings the existing malady to light.

Czerny and Keller have made an important advance by the creation of the term "food injury." One should accustom themselves to associate food with a specific functional stimulus and to consider processes of nutrition as complicated biological reaction which are started through the stimulus of the ingested food and which, after passing through a number of phases, reach their end by the construction of tissue and by the expulsion of excreta. The clinician should closely observe the effects of food upon the functions of the body. The reaction of food is as prompt as a reaction to poison. To distinguish alimentary from non-alimentary symptoms the effect of food changes in food elements or of the withdrawal or increase of nourishment should be noticed. All symptoms which are influenced by change in diet are to be regarded as originating in nutritional processes. In health all functions are performed in a quiet, orderly way. The healthy child possesses a strong immunity and is especially characterized by a physiologic breadth of tolerance for various kinds of food. Provided the food fills the nutritional needs the digestion is equally good with breast or bottle, concentrated or diluted nourishment with more or less fats or carbohydrates. It will respond to a moderate increase in food by a gain in weight. If a baby thrives on the usual artificial diet of milk and sweetened water it is the best security for continued health and development. With a disturbance of nutrition there is a lowering of tolerance for both quantity and kind of food. The strength of digestion should be tested by giving small quantities of food. In intoxication no dietetic test can be used. After detoxication the degree of injury is evident when nourishment is given. Symptoms will recur when the function of assimilation is exceeded, and excepting during a terminal attack there is always a diet which can be digested with ease.

Finkelstein gives four types of disturbance of nutrition with numerous transitional stages.

First Stage.—Disturbance of balance; the breadth of tolerance is lessened; with a limited diet the child is normal. An increase or variation of food will diminish the weight.

Second Stage.—Stage of dyspepsia. The degree of tolerance is much diminished, so that the child only remains free from symptoms when the diet is just at, or under, the need of nutrition. If this limit of food be exceeded a paradoxical reaction occurs with pathological stools and variations of temperature.

Third Stage.—First severe type decomposition or atrophy. The toleration of food, first against fats, later against sugar, is injured in the most extreme degree. With an increase of food the child reacts with a sudden loss in weight, subnormal temperature, irregularities in the rhythm of breathing and cardiac depression.

Fourth Stage.—Intoxication. Already described.

There are two severe forms of infantile nutritional disturbance which may exist separately or may be associated. First, alimentary intoxication. Second, alimentary decomposition or atrophy. A condition which is free from all signs of toxemia and which passes through the stages of disturbance of balance and afebrile dyspepsia with continual emaciation to a state which I will designate as alimentary decomposition.

Finkelstein's observations were made only on children who were given milk mixtures. In the stage of balance disturbance the organism assimilates the foods in necessary quantities, but does not do the work with normal steadiness. The changes in the stools, fat or soap stools, are discovered only by a laboratory analysis. There are slight fluctuations in temperature, irregular gains or losses in weight. We find a characteristic paradoxical reaction with food. Only a limited amount is utilized. If the food be increased there is more work but no gain. With food elements whose utilization offers special difficulties, the weight is diminished. Regarding the doctrine of the difficult digestion of casein no change was noticed from its increase or diminution, excepting from a physiologic lack of albumin. There was no difference between whole milk, skim milk or buttermilk. The same successes, failures and consistencies of stools. Sweetened buttermilk has the same effect as skim milk with a carbohydrate. With a disturbance of balance the most important rôle is played by fat. It is not possible by increasing the fats to hasten the gain in weight; further, many children do well on fat poor or fat free carbohydrates and the gain in weight is arrested when fat is added to the food and commences again when fat is left out. This is a paradoxical symptom when the exclusion of what is usually held to be a food element of the first class has a favorable effect upon the weight. Children who digest fat poorly usually possess an undiminished tolerance for carbohydrates, and often make great progress on fat poor carbohydrate rich diet—the malt soups, buttermilk, etc.

This experience has been utilized for years. Assimilation of fats makes greater requirements upon metabolism than carbohydrates. In patients who do not progress satisfactorily on a fat free diet, normal relations are only preserved when carbohydrates are closely restricted. A gain is not possible on this limited food. If one tries to raise the carbohydrates dyspeptic symptoms appear. Only with older, healthy children, with a fat free, carbohydrate diet, will one see a stationary weight without dyspepsia. This is practically a disturbance of balance and the addition of fat has a favorable effect upon the weight. After a certain abstinence fat is necessary. Mother's milk is beneficial in all cases of disturbance of balance. It quickly improves nutrition and weight. The exception is children with a congenitally weak metabolism.

STAGE OF DYSPEPSIA.

A baby with balanced disturbance passes easily into a dyspeptic condition. The cause may be contaminated milk, but is more frequently a fermentation produced by a disproportion between the quantity of food and the strength of the digestion. The clinical picture of dyspepsia is purely local, abnormal fermentation with its reaction upon the motor and secretory functions of the gastrointestinal tracts. Only when the amount of food is far under the physiologic necessity is the child free from symptoms. With an increase in food beyond the digestive tolerance there are frequent pathologic stools, fever and emaciation. A severe injury of the intermediate metabolism places the condition outside the boundaries of dyspepsia and indicates the approach of danger, intoxication or atrophy. Atrophy or alimentary decomposition may simulate dyspepsia when the nourishment is much restricted. The influence of correct dietetics in the dyspeptic troubles of bottle-fed babies is shown in the curative effect of woman's milk. The normal activity of the intestines returns and the stools and flora become those of a breast-fed infant. Fat is an element of cow's milk which causes fermentation. The exclusion of fat will often relieve dyspeptic vomiting. An excess of carbohydrates will also produce fermentation. Many dyspeptic troubles are stopped by cutting out carbohydrates and diluting the milk with water. Starch dyspepsia is well known. The tolerance for malt or dextrine is often greater than for milk or cane sugar. It is a common experience in dyspepsia to obtain improvement by Liebig's soup or malt extract. The best remedy for dyspepsia is skim milk or buttermilk. With correct indications and dose this fat free sugar poor diet will cure every true dyspepsia. The lactic acid bacillus is not the curative agent in buttermilk. Cooked buttermilk or skim milk are equally effective. Clean, fresh skim milk from the separator should be used. Its therapeutic value is due to the absence of fermentative elements. In many cases intestinal digestion is so weakened that the slight amount of sugar in skim milk will cause disturbance. Cases of dyspepsia which, in spite of restricted diet, are not considerably improved at the end of a week are in the first stages of atrophy and can usually be saved only by the breast.

As to the apparent failures of skim milk therapy slight enteral and parenteral infections and influenza may appear in the guise of dyspepsia and are not favorably influenced by diet. Slight cases of dyspepsia react to large amounts of food and are relieved by slight diminutions. Severe cases require so scanty a diet that the weight cannot be maintained. Protracted dyspepsia weakens the resistance of the organism to chemical and bacteriologic damage. There is increasing injury to the functions which dispose of the food in normal metabolism. With the destruction of these external bulwarks there begins a disturbance which will end with death if not prevented by timely medical aid.

Dyspepsia is a borderland state leading to intoxication or atrophy.

ATROPHY OR ALIMENTARY DECOMPOSITION.

Atrophy is best studied in children fed on top milk or milk diluted with cereal gruels. At first there are slight gains and losses in weight. With a transition from dyspepsia to atrophy there is a steady emaciation. The child becomes excitable, has disturbed sleep and takes the bottle greedily. The stools may be at first normal, especially if the baby is breast-fed. Later we observe soap or fat stools. The wasting may be slow or rapid, like a death from starvation with abundant nourishment. The more food given the thinner the patient becomes. The only way to arrest the loss in weight, if, indeed, it be not too late, is to diminish the food. An excess of food beyond the child's small tolerance destroys the tissues which in healthier days are constructed. Often an atrophic child is improved by minute quantities of breast milk, while a theoretically sufficient amount has a disastrous effect. Usually increasing the fats in any way will reduce the weight. Emaciation may follow this change from a salt rich to a salt poor diet.

A stationary weight does not mean the nutritional needs are covered. Even with insufficient calories, if enough salt and water are given, the loss in weight is not seen for a long time. In atrophy the food elements which cause the wasting are fats and carbohydrates. A case will often improve if skim milk be substituted for whole milk. The tolerance for fats is first injured, later the tolerance for carbohydrates. An atrophic child on a fat poor mixture grows rapidly worse if cream is added. Increasing the fats accelerates the loss in weight and may cause a fatal collapse. Wonderful as it may seem, disturbances of heart beat and rhythm of respiration may be caused by addition of fats and relieved by their withdrawal. In severely disturbed children fat acts as a specific poison to the heart and respiration. Fat, esteemed as the best heat producer, will, in an atrophic child, cause a lowering of temperature. The same toxic effects are noticed after castor- and cod-liver oil.

While the assimilation of fats is destroyed the tolerance for carbohydrates may be preserved for a while and on them a good increase in weight may be maintained. But only a few children react in this favorable way. Many children show at once a lowered carbohydrate tolerance and the elimination of fats and carbohydrates has usually a beneficial effect in atrophy. In advanced cases the weakened functions will not grow on skim milk.

In fact, the patient cannot be nourished at all, and only in the earlier stages of atrophy can its course be stopped by diminishing the food. It is peculiar that the functional tolerance starts from a certain moment and steadily progresses in spite of reduction in quantities of food or changes in food elements.

Finkelstein divides atrophy or alimentary decomposition into three stages:—

(1) Resembles dyspepsia. Restriction in food is followed by an arrest of emaciation and improvement in stools.

(2) Loss in weight is arrested very slowly. Stools remain pathologic. Increasing the food causes a recurrence of symptoms. Recovery by artificial food is exceptional.

(3) The functional tolerance is almost gone. It is not to be controlled by even small amounts of food. Its weakness is demonstrated by the injurious effects of rich breast milk.

In most cases death is due to a terminal intoxication from sugar. The steady fall of the weight curve measures the declining tolerance for food. Finkelstein's experience with artificial feeding in atrophy is that if the functional tolerance has not been augmented in a few days a further trial of the bottle is useless. To continue it is a choice between death from decomposition and death from hunger.

REACTION OF AN ATROPHIC CHILD TO BREAST MILK.

One occasionally sees the typical picture of marasmus in a breast-fed baby. There is a stationary period for weeks, then a downward curve. Assimilation of fats is badly damaged and the case recovers only on a carbohydrate diet. So even with woman's milk the evil consequences of a lowered fat and sugar tolerance cannot be avoided. The wonderful therapeutic power of breast milk probably resides in the portion free of fat and sugar. If breast milk be given to an atrophic child only minute doses should be administered at first. In bad cases 40 or 50 grams daily, later 100 to 150 c.c. The need for fluids is to be met with water or tea sweetened with saccharine. The danger of inanition must be risked. In this way a few children can be saved by a special technique. Finally, atrophy is the progressive lessening for all foods. It is alimentary and is not a simple emaciation from starvation. All the tissues of the body are involved. There is a dangerous fall in the strength of digestion reaching complete destruction of function. The full energy of the digestive powers is necessary for life. Their weakening or inactivity leads to death. Food, after overcoming the primary resistance of the child, increases the trouble, hence the creation of the term alimentary decomposition.

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PREVENTION OF DIPHTHERIA.—Giuseppe Pecori (*Gazzetta Medica di Roma,* January 15th and February 1st) states that as a result of the introduction of antitoxin in the treatment of diphtheria it is found that although the mortality is decreased, the morbidity from the disease is not decreased. This is due to the carelessness which results from the feeling of safety that has been gained in so severe a disease. This is a distinct disadvantage, inasmuch as it is found that the persons surrounding the patient, the immunized children of the family, and the convalescent himself, are still carriers of the bacillus in a virulent form. The convalescent carries around in his throat for several weeks germs which are capable of infecting others. If he is allowed, as is so often the case, to mingle with the rest of the family and its visitors after a few days of isolation, the spread of the disease is much increased. One of the most frequent routes of spreading is by the school. It is found that the months in which diphtheria is least frequent are those in which children do not go to school. The prevention of infection is accomplished by various measures, some general, some special to individuals, which must be combined intelligently. The measures suggested by the author are these: Isolation of the patient from the beginning of the disease and throughout convalescence, as long as cultures show the presence of the bacilli in the throat or nose. The school must be recognized as of importance as a means of spreading the disease. All pupils and teachers who live in a family in which there has been diphtheria should be excluded until a certificate can be shown stating that bacilli are no longer present in the throat of the patient, or of any member of the family. A period of at least seven weeks having elapsed, rigorous disinfection of the entire house, the school, and all places where the patient has been during the course of the disease should be carried out.—*American Journal of Obstetrics.*

THE RELATION OF EXERCISE TO ADOLESCENT HEART DEVELOPMENT.

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Indulgence in vigorous sports is to be welcomed for young men, not only for the cultivation of the hardy, elemental qualities of courage and perseverance, but because vigorous exercise in youth is necessary for the best physical development. Of course, as in the case of all good things, there is apt to be an over-indulgence in these sports, and unless there is a fairly rigid control over the situation the few cases where bad results are obtained will be so widely known and the resulting prejudice against virile exercise will be so deeply grounded that the benefit derived by the innumerable other cases will have difficulty in showing itself.

It is true that some cases have been harmed, but we cannot better the condition of things by covering them up or denying them. We must discover the causes and eliminate them wherever it is possible. The heart is the organ most often affected by too vigorous exercise. Perhaps a more widespread knowledge of the development, strength and action of the adolescent heart would give us better results. Two high-school boys whom I have recently examined, although they have no valvular lesions, had apices which were displaced downward and to the left to the sixth space. The trouble in each case was undoubtedly the result of too much exercise. One told me that he had been practising running about three or four miles every night. The other said he had been in the habit of playing basket-ball for more than an hour every afternoon. As their hearts showed, the exercise taken by these boys was too much for them at their stage of development. Both were prepubescent. It might not have been excessive for boys three or four years older. Why? Because there is a decided difference in strength in the pre- and postpubescent heart.

It has been shown (Hall) that there is a great increase in the size of the heart during the adolescent period and also that there is a difference in the heart sounds of the pre- and postpubescent heart (Crampton). The examination of several hundred boys who had just been admitted to the high schools, among whom were a considerable number of prepubescents, confirms the statement of a difference in heart sounds. From my observations I find that the differences are mainly as follows:—

(1) That the postpubescent heart shows an increase of the muscular element of the first sound as compared to the prepubescent.

(2) The postpubescent first sound seems to be relatively lengthened in time.

(3) The second sound of the postpubescent heart seems to be less prominent than the second sound of the prepubescent heart.

(4) In the prepubescent heart, the second sound often seems relatively very distinct.

This increase in muscular quality is what normally takes place during adolescence when the human organism receives the stimulation that is usual for a young man to desire at this time, in the shape of vigorous exercise. But it does not take place when the customary amount of exercise for any reason is withheld. Its presence is an indication of normal development; its absence an indication of at least retarded development.

There may be many reasons why exercise of a strenuous kind should be withheld from a boy, but in the proportion that an adolescent boy is deprived of the normal amount of exercise which demands increased heart action, in just that proportion do we diminish for the time at least the normal growth of the heart. This is the time, too, when there are the greatest latent possibilities of growth. It is by taking advantage of this period of natural development of cardiac strength that we can approach Nature's maximum of each individual's vigor—a strong, slow, steady heart beat with great reserve power.

An undeveloped heart condition was quite noticeable in boys who were unusually stout and who were not very anxious to exercise on account of the great handicap of weight. Other stout boys, who were active in some kind of sport, notably swimming, showed a normal increase of the muscular quality of the first sound. In another case, the circumstances were somewhat different, but the results were the same. The boy told me he had been ill for about two years, during which time all exercise except the mildest and most necessary had been forbidden. Although he was postpubescent his heart showed the same characteristics that we would expect in a boy two, three or four years younger.

Many other cases questioned concerning their exercise prove the necessity of vigorous exercise at puberty or early adolescence in order to obtain normal muscular cardiac development.

Height, weight, pubescence and heart development have a very decided relationship. In a general way, and yet more definitely and exactly than some of us realize, boys of a certain age of pubescence approximate uniformity in the same height, the same weight and the same degree of heart development. That there are some exceptions, I have noted above. But I believe it is possible to judge a boy's development and his condition, as well as very often his habits of exercise, from the examination of the heart. By this means of examination, too, we can more intelligently advise exercise suitable to his condition, reserving for post-pubescence those exercises which require violent, continuous hard work, and giving to pubescents vigorous precipitant exercises of shorter duration with frequent intervals of rest.

As a rule, the coincident occurrence of puberty with increased muscular power of the heart might make heart examinations unnecessary if it were not for the exceptions, some of which were just pointed out, and the cases where there are diseases of the valves. In a recent examination of 1,750 boys, 7.2 per cent. showed heart murmurs. Since about 3 per cent. of these were hemic murmurs, there remained about 4 per cent. of the students who have valvular diseases. In another examination of 460 boys who had just been admitted to high school, I found 43 cases in which heart murmurs were detected, 2c being valvular and 23 hemic; 10 cases showed irregularity in rhythm and 4 cases showed a decided displacement of the apex downward and to the left, 3 being in the sixth space.

Incidentally, I should draw attention to the relatively great number of hemic murmurs at this age. Is it not possible that this rather large percentage of hemic murmurs may be due to the rapid growth and the resultant unequal adjustment of the heart valves? These murmurs, which are generally systolic in character, having their maximum intensity at the second left intercostal space, have never been very satisfactorily explained. They have received the names "hemic," "functional" and "accidental"—terms used to explain their supposed cause. It is true that nearly all of the cases of functional or hemic murmurs mentioned above were associated with anemia. But many cases considerably more anemic had no heart murmurs, and a condition of anemia, with its consequent deficient nutrition, might easily result in an unequal or retarded development which could be remedied by the later growth—a theory which might explain the transient character of the hemic murmur.

In cases of cardiac trouble it can be easily seen that unless advice be given as regards amount and kind of exercise there is a possibility that the boy may take more exercise than would be good for him, and even enough to be dangerous for a heart which, under the ordinary conditions of life, be overworked. I think it is not possible, in the handling of so many students, to give graded exercises suitable to each individual, but in a negative way we may be on the safe side if we simply state generally what these cases may *not* do; that is, excuse them from the "precipitant" exercises, the heavy apparatus work and the more vigorous games. Of course, it may be quite possible for a person with a distinct murmur to engage in athletics without having anything like a fatal, or, apparently, without even a serious, result. I know a young man who played soccer foot-ball an entire season in spite of the fact that he had a decided leakage at the mitral valve and an apex beyond the nipple line. But such exercises are decidedly dangerous for persons with weak or diseased hearts, and it should be the rule that no athlete might compete unless he had been examined and the condition of his heart found satisfactory. In the cases of heart lesions I believe we should err on the side of too little exercise rather than too much. And in cases of hearts having no lesions we should grade our exercises for boys according to the degree of muscular quality of heart sounds.

SUMMARY.

(1) Vigorous exercise is necessary for the boy at puberty to secure the normal heart development.

(2) During the training of athletes and in contests we should endeavor to make allowance for the fact that the lesser muscular development of the prepubescent heart makes it unfit for prolonged, violent exercise.

(3) Hearts of all school boys should be examined and suitable regulation of exercise suggested when necessary.

(4) No boys with heart murmurs should be allowed to indulge in the physical training work involving decidedly increased heart action or to enter any athletic contests.

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CONGENITAL CYST OF THE LIVER, WITH REPORT OF A CASE.*

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An exhaustive review of non-parasitic cysts of the liver was made by Moschowitz in 1906, and he was only able to find 85 cases in the literature. Since that date we have discovered 3 more reported cases, making a total of 88. Two of these occurred in the fetus, 7 in the newborn, 4 in the first year, 1 eleven years of age, and the remainder in adult life. By far the largest number of cases were in persons over sixty years of age, and Claude, a French author, goes so far as to state that cysts of the liver are found exclusively in persons of advanced age. Multiple cysts were found in all the cases occurring in infants, and in every case there were malformations or abnormalities in other organs—most commonly cystic degeneration of the kidneys.

The following case of a single non-parasitic cyst of the liver in an infant, with operation and histologic examination, is of such unusual occurrence as to merit its presentation before this Society.

Priscilla M. B. was referred to Dr. Shaw by Dr. Woodruff, of Pittsfield, to whom we are indebted for the very complete history. She was born July 20, 1907. The labor was normal and uneventful and the birth weight was 9½ pounds. The mother was thirty-eight years old, had mitral regurgitation and was not very strong. The father was forty-five years old and had chronic nephritis. There was no history of alcoholism or syphilis. For nine months she was fed exclusively on the breast, and at three months (?) she weighed 19 pounds. The child was perfectly healthy and well until July, 1908, when she had a severe attack of ileocolitis. At this time, when examining the abdomen, Dr. Woodruff first discovered a small but distinct mass at the right costal border of the ribs, which he considered an enlargement of the right lobe of the liver, due to the intestinal infection. The child recovered after a few weeks and no more attention was paid to the enlarged liver. The color improved and there was a marked gain in weight after this illness. She contracted measles at the end of August, when thirteen months old, and made an uneventful recovery. A few weeks later the prominence of the right side of the abdomen became more pronounced and it continued to increase in size. There had never been any jaundice, pain, or any subjective symptoms referable to the liver. The appetite was excellent and the child was notably bright, intelligent and playful.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 29, 1909.

The child was brought to Albany for the first time on December 14, 1908, when she was seventeen months old. She is a well developed child, weighing 31 pounds. She has had four meals a day of a plain, simple diet, with plenty of milk. The appetite has been good and the bowels regular. The mother stated that she first noticed the "lump" last August, when it seemed about the size of an orange. She is certain that it became much smaller, but has grown rapidly larger for the past four weeks.

The color is good and there are no evidences of rickets. The circumference of the head is 18¼ inches, of the chest 20½ inches, of the abdomen just above the navel 22 inches. The examination of the lungs and heart is negative, and the lymph nodes are not enlarged. There is no jaundice of the skin or conjunctiva. The abdomen is greatly distended, but the superficial abdominal veins are not enlarged and the umbilicus is depressed. The upper border of liver dullness is at the upper border of the fifth rib, and below it extends to the right iliac fossa and to the median line. The edge is sharp and the surface smooth and free from nodules. Percussion and deep palpation are not painful and the baby evidenced no discomfort during the examination. The left side of the abdomen is tympanitic and there are no evidences of fluid or masses. The extremities show nothing abnormal.

No positive diagnosis was made. The whole appearance of the baby, the physical examination and the history, seemed to exclude sarcoma or any malignant growth of the liver or kidney. There was no edema or ascites and the spleen was not enlarged, so the condition could not have been due to an amyloid liver. There were no evidences of syphilis. The persistent absence of jaundice would exclude fatty liver or hypertrophic cirrhosis. That the possibility of cyst of the liver was not considered is perhaps not to be wondered at, as an eminent surgeon has stated that cysts of the liver belong to the unexpected in surgery. An exploratory incision was deemed both advisable and justifiable, and the child was referred to Dr. Elting.

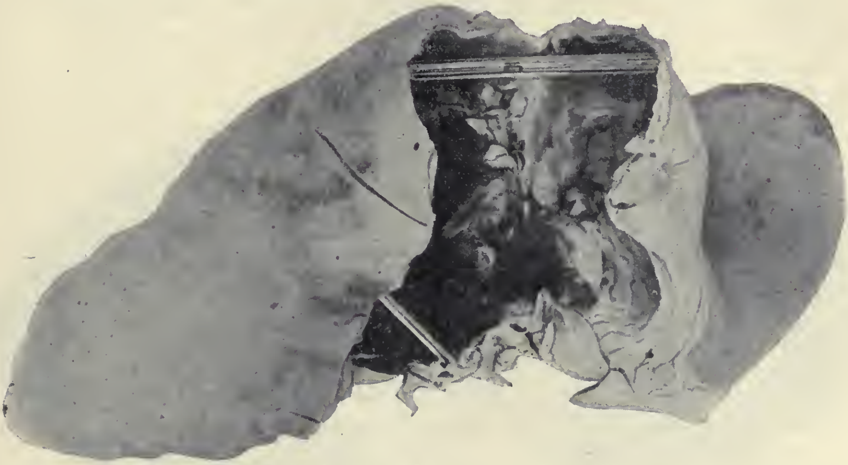
SURGICAL REPORT BY DR. ELTING.

On admission to the hospital the patient presented a marked enlargement of the entire abdomen, which was somewhat asymmetrical, the right hypochondrium being decidedly more prominent. On palpation a very distinct tumor mass could be made out, which occupied the entire upper right quadrant of the abdomen and extended downward to the level of the umbilicus. The tumor was rather regular in outline, somewhat globular in shape, and appeared to be directly connected with the liver and the consistence was rather firm. The dullness of the liver was absolutely continuous with that over the tumor. There seemed to be a slight movement of the tumor with respiration. There was no tenderness on pressure. The tumor did not appear to extend to the left farther than the median abdominal line. Because of the child's excellent general condition, an exploratory laparotomy was deemed advisable. This was done under ether. Through a linear incision extending from the costal margin to the level of the umbilicus, about 3 cm. to the right of the median line, the abdomen was opened. The liver was found to be somewhat enlarged. The lower part of the right lobe seemed to be occupied by a globular tumor which protruded downward to about the level of the umbilicus. On palpation there seemed to be definite fluctuation in the tumor and the surface of the tumor at the lower portion was covered by a zone of liver tissue, approximately ½ cm. in thickness. The tumor was punctured and about 900 c.cm. of a clear yellow fluid withdrawn. The opening into the cyst cavity was enlarged and a rubber tube and vioform protective drain introduced into the cavity. The wound was closed with interrupted silk-worm gut. The patient stood the operation, which lasted about eighteen minutes, extremely well and left the table in good shape. There was practically no loss of blood and no evident shock. She continued in good condition for approximately two hours, when she suddenly died. As revealed by the postmortem there was no hemorrhage and no other definitely assignable cause for the death other than shock.

A careful examination of the fluid was made. It was found to contain a moderate amount of albumin and microscopically it showed only detritus; no cells or formed elements of any variety were found.

PARTIAL AUTOPSY DESCRIBED BY DR. WOLBACH, OF THE BENDER HYGIENIC LABORATORY.

Liver.—Weight, 625 grams. There is a large, thick walled cyst situated approximately in the median portion, but apparently taking origin in the central portion of the right lobe and extending about 3 cm. into the substance of the left. The superior and anterior portions of the cyst wall are thin and fibrous in appearance. It varies in thickness from .3 to .6 cm. At the anterior border the cyst wall is covered with a layer of liver tissue .2 to .5 cm. in thickness. Inferiorly the cyst wall consists of fibrous tissue with no suggestion of overlying liver tissue except at the Spigelian lobe. The latter is thin and concaved to fit the spherical curvature of the cyst wall. All external surfaces of the cyst are smooth and covered with peritoneum.



I. ANTERIOR VIEW, SHOWING CYST WALLS HELD APART BY GLASS RODS.

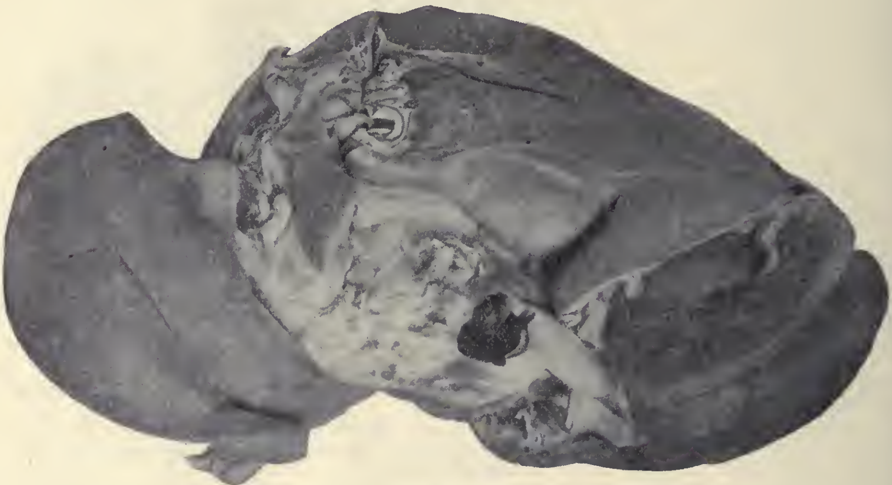
The gall-bladder lies in a deep fissure to the right of the cyst and contains a pale yellow, slightly viscid, transparent bile. The diameter of the cyst, which is nearly spherical, is 10 cm. The greater part of the inside is lined with a smooth glistening covering. In a few places there are remains of old hemorrhages beneath the surface. A large portion of the cyst wall contains recent hemorrhage upon the surface and beneath the surface of the lining. The liver tissue is pale reddish-grey in color. Consistency is slightly increased. Cut surfaces have a rather refractive appearance. Lobular outlines are prominent, owing to injection in central veins. Peritoneal surfaces of both lobes are slightly injected.

Kidneys.—Apparently normal.

Spleen.—Apparently normal.

MICROSCOPIC EXAMINATION.—*Liver.*—There is a considerable increase of connective tissue throughout the liver in the portal spaces. The arrangement of lobules is normal and the liver cells are normal. The connective tissue of the portal spaces is dense, and contains tortuous bile ducts and occasional groups of atrophied liver cells.

The cyst wall (six places examined) consists of dense fibrous tissue without a lining layer of cells. The inner surface in many places is necrotic and contains fibrin between the cells and bundles of collagenous fibrils. In other places there are hemorrhages into the cyst wall and on the inner surface. In a few places there is granulation tissue growing into the foci of hemorrhage. Externally the cyst wall is continuous with bands of connective tissue extending between the lobules into the liver substance. These bands of connective tissue are concentrically arranged to the cyst wall and contain atrophied islands of liver cells and tortuous bile ducts.



II. POSTERIOR VIEW.

Spleen.—Negative, except for marked injection and slight hyperplasia of germinal centers in the secondary follicles.

Kidney.—Negative.

Epicrisis.—In the absence of a lining membrane or islands of lining cells to the cyst wall it is impossible to advance hypotheses for its origin. The irregular thickness of the wall is due to organization of small hemorrhages. The connective tissue increase in the adjacent liver substance is probably reactionary to pressure.

Numerous theories have been advanced to explain the formation of liver cysts. Ribbert calls them enterocysts and finds the cause in an embryonic malformation of the mesoblast. The liver is developed in the anterior mesentery and its mesoblastic elements have a common origin with the diaphragm. Its ducts and glandular elements are derived from a sprout from the duodenum. The liver, therefore, is an outgrowth and appendage of the alimentary tube. The early embryonal buddings from the primitive digestive tract with the involved infolds from the primary embryonal plates are not yet distinctly understood. Zahn collected 14 cases in adults with single cysts of the liver in which the cysts were lined with ciliated columnar epithelium. These cysts, without exception, were situated on the anterior surface of the liver in the neighborhood of the falciform ligament. He points out the fact that ciliated columnar epithelium is normally never found in the liver.

Still believes the cyst formation is a congenital malformation and not a disease or result of inflammation. They cannot be due to dilated bile ducts or to some obstruction, as jaundice is never present. He says: "The liver condition is not a progressive one, and the subjects of this malformation can live to old age with no symptoms referable to the liver, unless the distention produces mechanical effects, which very rarely happens."

Moschcowitz reached the conclusion that these cysts are always associated with congenital anomalies of the liver, consisting in aberrant bile ducts, which may be extrahepatic or intrahepatic. The cysts have their origin in these aberrant ducts and may assume two forms: One arising from inflammatory hyperplasia of these ducts, the other by retention of fluid in these ducts, the result of congenital obstruction.

Our case, unfortunately, does not offer any solution as to the etiology of cysts of the liver. From a diagnostic standpoint, it presents several interesting features, and the possibility of this condition in infants must be kept in mind when obscure abdominal conditions present themselves.

EMBRYONAL ADENOSARCOMA OF THE KIDNEY.*

BY MARTHA WOLLSTEIN, M.D.,
Pathologist to the Babies' Hospital of New York City.
(From the Pathological Laboratory of the Babies' Hospital.)

Abdominal growths in infants and young children involve the kidney more often than they do any other organ, and renal tumors, like those of any other viscus, may be benign or malignant in character. Of the latter there are four varieties—carcinoma, occurring almost exclusively in later adult life, yet not unknown in childhood (Baumgarten); sarcoma, occurring at all ages; hypernephroma, the most frequent type of kidney tumor among adults, also found in young children (Guthrie and D'Este; Cheesman); and, finally, the so-called mixed tumor, or embryonal adenosarcoma, appearing almost exclusively in infancy or early childhood, but not unknown in adult life. It is with this last variety of malignant renal neoplasms that this paper deals. In the older literature it has been variously characterized as carcinoma, sarcoma, adenosarcoma and myosarcoma, the majority of observers being agreed on one point at least—the mixed character of the growth from the microscopic point of view.

In 1894 Birch-Hirschfeld published his classic paper, pointing out that these mixed kidney tumors are identical in character and in origin, differing only in the proportional quantity of their component elements, of which two types are characteristic—glandular tubules and apparently undifferentiated embryonal cells. The growth may appear at any age, and may be present at birth. Thus Paul reported a case involving both kidneys in a seven months fetus, and Weigert's case, also double-sided, occurred in a newborn infant. On the other hand, Hedrén reports one in a woman fifty-four years old, and six other adult cases appear in the literature. With the help of Hedrén's excellent bibliography I have been able to find records of 106 cases of mixed embryonal kidney tumors, of which 19 were between one and two years old, 13 from two to three, and 18 from three to four years of age. Only 7 occurred during the second half of the first year, and 3 were present at birth. Sixty, then, occurred during the first four years of life, 10 during the fifth year, and 20 between five and thirteen years. In 9 the age is not stated, and 7 were adults from eighteen to fifty-four years old.

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* Read before the Alumnæ Association of the Woman's Medical College of Pennsylvania, May 27, 1909.

These tumors are malignant in character and end fatally, though recovery from operation and prolongation of life for some months, or even years, has been reported. Blumer's case lived three months after operation. One of Trappe's cases was alive, without recurrence, about a year after operation. Birch-Hirschfeld's original case came to autopsy seven and a half years after the tumor had been removed. One of Dr. Abbe's cases died of a recurrence three years after the growth had been removed by operation, while the other is still alive and well after almost sixteen years. This case is unique in medical literature. The tumor was a rhabdomyosarcoma of this embryonal type.

While the majority of the reported cases have occurred in one kidney only, double-sided growths have been observed by Eberth, Cohnheim, Eve, Hedrén, Merkel and Strong, besides the congenital cases of Weigert and Paul.

These tumors are found *in,* not merely near, the kidney. They may occur at either pole or in the central portion of the organ. They may originate in the pelvis or in the cortex. The kidney may remain to form a cap upon the tumor, or it may be compressed into a mere shell surrounding the growth. It is the rule, however, for the tumor to be distinctly and sharply differentiated from the kidney substance by a capsule.

Microscopically, the following elements have been found—myxomatous tissue, fibrous connective tissue, elastic tissue, fat, cartilage, bone (Hedrén), unstriped muscle, striped muscle, epithelial tubules, epidermal epithelium and nerve cells (Ribbert).

The case I wish to report was observed at the Babies' Hospital of New York City. It affected a boy of two years and two months of age, of good family and personal history, admitted because of a lump in the left side, first noticed two weeks before. The boy was poorly developed and nourished, slightly rachitic as to head and chest formation and presented an enlarged abdomen, containing a hard, movable mass which filled the entire left iliac region and extended to within two inches of the costal margin. The mass was neither painful nor tender. Blood examination revealed a hemoglobin percentage of 50, 13,000 leukocytes and 4,956,000 red blood cells. An operation was decided upon, and as the child had lost in strength a transfusion from father to son (wrist to ankle) was performed by Dr. Downes on the afternoon of the day before that set for the operation. During the transfusion the boy's hemoglobin rose from 45 to 85 per cent., falling to 65 per cent. on the following morning. The operation was well borne, and the entire left kidney, with its tumor, was removed. The child made a good recovery, being discharged from the hospital in good condition after five weeks. He continued to gain for several weeks and then developed pertussis, from which he also recovered. Four months after his discharge from the hospital two nodules were noticed beneath the skin near the scar; they were movable. Just six months after the first operation he was readmitted in an anemic, though well nourished, condition, his abdomen measuring 63 cm. In the left lower quadrant a hard, firm, immovable mass was felt, extending upward toward the axilla. It measured 6½ x 3¼ cm., and was not painful on palpation. The child seemed bright and happy. These nodules were felt under the old scar. A second operation was done six months and five days after the first one. Three nodules, measuring from 4 to 6 cm. in diameter, were shelled out from their bed between the deep and superficial abdominal fascia. The tumor itself was situated retroperitoneally, adherent on all sides, so that its removal was not practicable. It was incised, however, and some of the soft, greyish, translucent contents removed. The boy again recovered from the operation, but two weeks later the tumor mass had become distinctly larger, and the abdominal veins were distended. Two nodules appeared in the scar. In another week the child had grown much weaker. He suddenly developed a general convulsion, followed by convulsive movements of the right side of the face and body, continuing until death came, twelve hours later.

The *autopsy* was performed two and a half hours after death. The body was poorly nourished. The *abdomen* measured 70½ cm. at the umbilicus. In the left lumbar region there was a scar 8 cm. long. Below this, in the left inguinal region, was a second scar 5 cm. long, and an open, incised wound of 2½ cm., through which two round, soft, red and white tumor masses were protruding. These measured 2½ x 4 cm. in diameter and were connected with the intraabdominal tumor. The lips of the wound were healthy, not fresh.

Abdominal Cavity.—Peritoneum normal. In the hypogastrium was a large, round, smooth tumor, blue in color and covered with distended blood vessels. It was fluctuating and soft, measuring 15 cm. transversely, 11 cm. longitudinally, and 33 cm. in circumference. Just above it, lying behind the intestines, was a smaller, round mass, 9 x 6½ cm. in diameter. Both these masses were connected with a third tumor of the same size as the second, occupying the site of the kidney removed seven months previously. The three growths were all retroperitoneal, and so intimately connected that in the attempt to remove the mass compression of one of the three caused leakage from the other two. The contents were greyish-red and white, soft, gelatinous, villous or papillary in character, exactly similar to the contents of part of the original and all of the second mass removed at the operations. Below the tumor, in the lumbar (kidney) region, were two nodules 4 cm. long, connected with an elongated mass which had dissected between the muscles and the abdominal wall, causing thickening and hardening to a cartilaginous consistency at a point just within the wound, and connected with the prolapsed masses visible outside the wound. The weight of the whole tumor could not be accurately determined, because its contents were lost so quickly; the remainder weighed 1,355 grams. It was necessary to remove an area of muscle 12 cm. long from the left abdominal wall in order to take out the entire mass of new growth. (See Figure 1.) The aorta was surrounded by the tumor and was drawn to the left side, the bifurcation taking place at the level of the middle of the largest mass. Vessels of fair size were found running from the aorta directly to the growth. Above the left-sided tumor a soft, elliptical mass lay close against the diaphragm, not connected with the tumor at any point. It was smooth, covered with a glistening capsule, and its section showed that it consisted of a soft, hemorrhagically infiltrated villus-like substance similar to the contents of the larger tumors. A larger mass of like appearance, weighing 157 grams and measuring 12 x 15 x 2 cm., lay on the right side, behind the liver, against the abdominal wall, which was roughened by its removal. These two pieces, not connected with the main tumor, were not unlike placenta in appearance.

Right Kidney.—Grey, capsule free, surface smooth, cortex slightly thickened, markings blurred. Size 10 x 6 x 4 cm.

Suprarenal.—On right side normal. No trace of the left one could be found.

Lungs.—Attached to the anterior border of the left lower lobe was a heart-shaped red mass 4 x 5 cm., its base attached by a broad pedicle of lung tissue to the substance of the lower lobe, while the apex was loosely connected to the pleura of the upper and lower lobes respectively. On section this mass was identical with the largest one in the abdomen. On the base of the right lower lobe, rising above the level of the lung substance, was a flat, metastatic nodule 3 x 4 cm. in diameter. A second nodule was embedded in the lung tissue near the outer surface of the lower lobe, and a third nodule was in its anterior border. The bronchial lymph nodes were not enlarged, and showed no metastases.

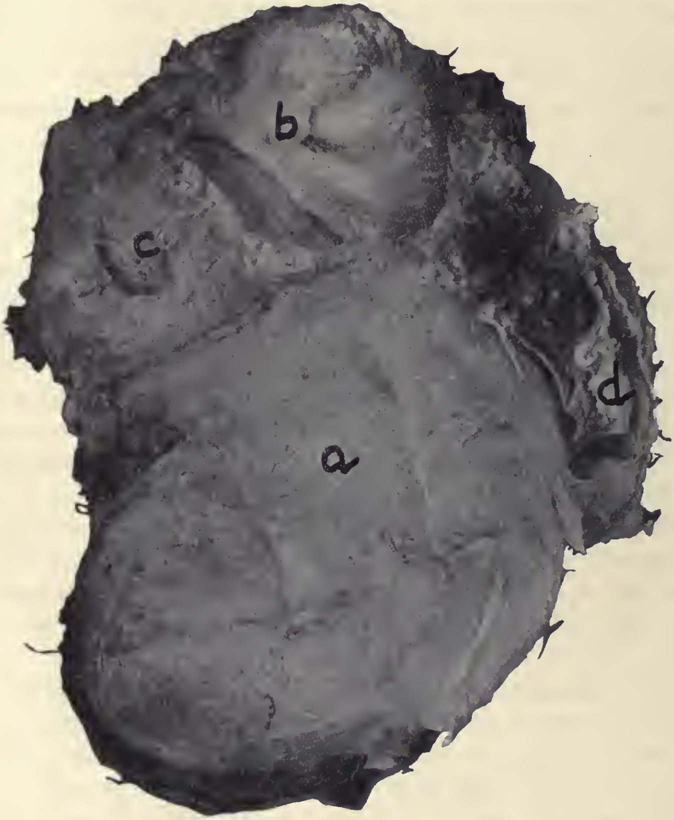

FIGURE 1. Secondary tumor removed at autopsy. *a, b, c,* the three lobes of the growth; *d,* infiltrated abdominal walls.

Heart, liver, spleen, intestines and *abdominal lymph nodes* were free from metastases.

ANATOMICAL DIAGNOSIS.—Multiple, secondary abdominal tumors; operation wound with prolapsed tumor nodules; tumefaction of the abdominal wall above wound; metastases in both lungs; carnification of left lower lobe.

The specimen removed at the first operation (Figure 2) consisted of the left kidney, with a nodule in its pelvis and a large tumor projecting from its cortex. The kidney itself was of average size. The ureter was normal in size and shape, and curved over a reddish-grey, soft, round nodule, which completely filled the hilum. The entire mass weighed 573 grams and measured 16 x 17 cm. in diameter. Its circumference was 28.5 cm. The cut surface was soft, mottled grey and red, with hemorrhagic and softened areas, as well as empty elongated cyst-like spaces beneath the capsule. The soft, grey substance protruded above the level of the denser portions. The tumor was sharply limited from the kidney substance, into the medulla of which it had extended, by a thin capsule. The pelvic nodule encroached upon

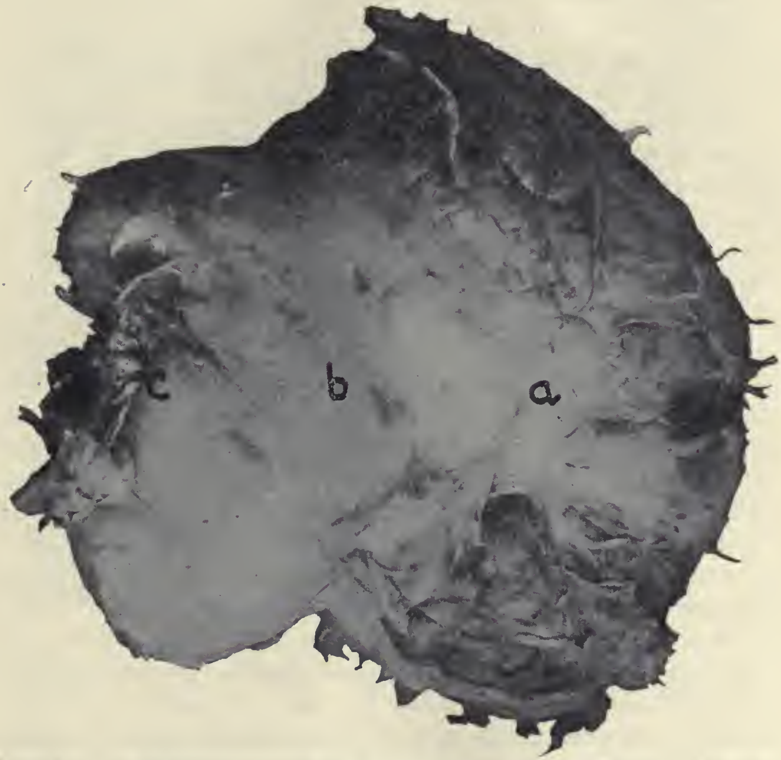

FIGURE 2. *a*, original tumor; *b*, kidney; *c*, nodule in pelvis of kidney. At the extreme left, pointing downward, is seen the ureter.

the medulla also, but did not meet the larger tumor, a narrow layer of kidney substance remaining between their respective capsules. The poles of the kidney consisted of well-preserved renal tissue, cortex and medullary portions being normally arranged. In the central part, on the contrary, the two new growths had taken the place of all but a narrow medullary zone of renal substance.

At the second operation three small nodules, 2 x 3 cm. in diameter, and a quantity of soft, gelatinous material were removed. The nodules, on section, showed the mottled appearance of the original growth.

MICROSCOPIC EXAMINATION. (1) *The Primary Tumor.*—The material was placed in Zenker's fluid within half an hour of removal from the body. Sections were stained with hematoxylon and eosin, methylene blue and eosin, and Mallory's connective tissue stain. The sections showed a stroma of fibrous connective tissue containing comparatively many spindle cells. The connective tissue fibers were loosely combined into septa, which separated the growth into irregularly shaped lobules, within which thinner bundles outlined alveoli. These contained cells which were round, and had a comparatively large, deeply staining nucleus. Some alveoli were tightly packed with such cells only. Others showed a grouping of some of the cells around a central point, which arrangement, in the same or in other alveoli, became distinct as the beginning of a tubule with a small lumen and a lining of a single row of columnar epithelial cells. The tubules varied in shape and size as they did in number. Few were elongated, and some were branched. (See Figure 3.) That they were formed from the round indifferent cells was quite plain. Many of the cells showed karyokinetic figures. In some of the alveoli spindle cells were the predominating feature. There were fields under the microscope in which the growth was very like that of a carcinoma, while others resembled a sarcoma, and in others the gland tubules were so numerous as to resemble adenoma. By means of Mallory's connective tissue stain a delicate basement membrane was demonstrated in the tubules, and a complete absence of stroma between the cells within the lobules was evident. Blood vessels were numerous in the connective septa and in the stroma. They were very thin walled. In many places hemorrhages had occurred in the stroma and into the alveoli, the blood cells lying between the tumor cells. Beneath the capsule of the tumor were some structures resembling glomeruli of incomplete or imperfect formation; the tubules were most numerous at this point, and some had become dilated into cysts, with their epithelial lining so flattened as to be scarcely discernible.

(2) *Kidney Substance.*—This showed no lesion beyond a moderate amount of cloudy swelling of the cells in the cortical tubules. The glomeruli varied somewhat in size, but their capsules were not thickened. There was no exudation and no connective tissue increase.

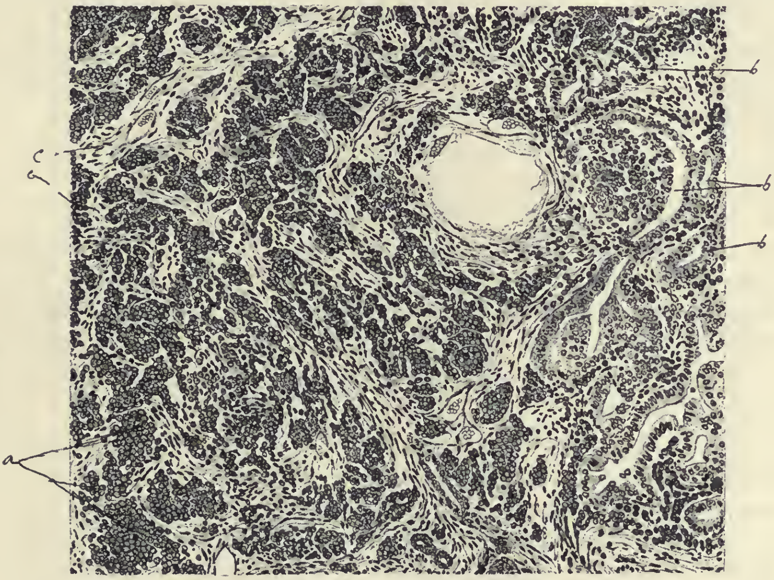

FIG. 3. SECTION OF PRIMARY TUMOR.
(*a*) Alveoli packed with round cells. (*b*) Tubules. (*c*) Stroma.

(3) *Secondary Tumor Removed at Second Operation.*—Sections showed a structure very much like that of the original growth. The tubules seemed to be more generally distributed in all the alveoli in all the sections, and the cells were more generally round, regular and closely packed. The stroma was very delicate and the blood vessels were numerous.

(4) *Detached Secondary Tumor on Right Side of Abdomen.*—This was composed of a very loose-meshed stroma, containing islands of round cells surrounded by large, very thin-walled blood

vessels closely packed with blood cells. There were no spindle cells apparent in this mass, which was evidently a rapidly growing one of earliest embryonal cells and blood vessels. The few tubules present in the cell islands were very small and round.

(5) *Metastasis in the Lungs.*—The structure resembled that of the original tumor. Karyokinetic figures in the cells within the alveoli were very numerous. One medium-sized blood vessel was found to contain a mass of tumor cells, evidently explaining the formation of these metastases. Much hemorrhage had occurred within the metastatic nodule. The lung substance was compressed by the new growth, making a narrow zone of atelectasis separating the metastasis from the adjacent normally aerated lung tissue.

(6) *Bronchial lymph nodes,* as well as retroperitoneal nodes, were free from evidence of metastatic growths.

(7) The *suprarenal capsule* on the right side was normal.

(8) *Infiltrated Abdominal Wall.*—The thickening was due to the presence of column-like masses of round cells between the bundles of striped muscle cells and between the connective tissue fibers of the fascia separating the muscle layers. Gland tubules were also present in the infiltrating masses, but blood vessels were very few in number.

SUMMARY.—The case presents several typical and several unique features. The history that the "lump" in the side was only noted two weeks before admission is a common one. Evidently the painless growth of the neoplasm proceeds to a point at which asymmetry of the abdomen is markedly noticeable before it calls attention to itself. The soft, friable character of the tumor, the villus-like masses which made up its contents, the recurrence in situ and the pulmonary metastases have all been noted in similar cases. The time of recurrence, about four months, is also about the average. On the other hand, the infiltration of the abdominal wall between the second wound and the site of the primary growth, and the secondary growth not connected with the primary one, lying between the liver and the abdominal wall opposite to the original tumor site, have not previously been described. This mass is to be explained by assuming an extension by direct continuity from the secondary growth, after rupture of its capsule at the second operation, which spread these rapidly growing embryonal elements over the outside of the tumor. It was a successful experiment in transplantation.

Trappe says, of one of his cases, that the entire abdomen was filled with metastases continuous with the primary growth. He does not describe these metastases further, and I understand them to be like the three continuous masses of the secondary growth in my case. The rapid and enormous growth of the recurrent tumor is well understood from the microscopic character of the primary and the secondary neoplasms, in which the undifferentiated embryonal cells were the predominating feature.

METASTASIS.—Birch-Hirschfeld says that metastases develop at a late stage in these tumors when the capsule has been broken. The blood stream carries the emboli of tumor cells, which lead to the formation of the metastatic growth, and consequently the liver and lungs are their most frequent seat. In addition, they have been noted in the peritoneum (Engelken), diaphragm (Eberth), suprarenal capsule (Wilms), ureter and along the vertebral column (Ribbert), and in the mesenteric lymph nodes by Borchard and Ribbert. These are the only instances in which the lymph nodes were involved, and the metastases are described by Borchard as alveolar, sarcomatous in character. Thrombi of tumor cells have been found in the renal vein (Ribbert, Merkel), and also in the vena cava (Merkel).

Birch-Hirschfeld explained the origin of the growths as occurring in an early developmental period, from the Wolffian body. He pointed out that such an origin would account not only for the glandular elements, but for the embryonal and mixed character of the stroma as well, and suggested the name embryonal adenosarcoma as most fitting and explanatory. In a second paper, four years later, Birch-Hirschfeld further emphasized and elaborated his views.

A second hypothesis for the explanation of the mixed character of these growths was put forward by Wilms in 1899. He leads their origin back to an even earlier developmental period than does Birch-Hirschfeld, before the Wolffian body has been formed. Thus he assumes that since all the elements present in the tumor are of mesodermal origin, a common anlage for all the component tissues is found in the apparently undifferentiated embryonal tissue of the mesoderm, which later develops into the myotom (striated muscle) sclerotom (myxomatous tissue, fibrous connective tissue, elastic tissue, fat, cartilage, bone and unstriated muscle) and nephrotom (glandular tubules). The finding of epiblastic epithelial elements by Muus did not undermine

Wilm's theory, since the mesoderm itself originates from the epiblast as well as from the hypoblast. Moreover, it is at the level of the origin of the embryonal and permanent kidneys that the mesoderm, originally a single layer, forms the scleromyotom and the nephrotom. Thus, at this early stage, all the elements found in embryonal adenosarcomata of the kidney are in very close proximity, and their misplacement is conceivable. Consequently it follows from Wilms' hypothesis that these tumors are all of congenital origin and conform to Cohnheim's theory of misplaced embryonal elements.

Muus believed that tumors of this variety originate in the anlage of the kidney itself, at a very early developmental stage, when undifferentiated cells are still present, and, by their proliferation, give rise to the neoplasm. He leaves the question of the origin of striated muscle open, as to whether it is formed by metaplasia from smooth muscle cells, or from excessive proliferation of the mesodermal cells in the earliest period of the kidney anlage. In Busse's theory metaplasia also plays a part, the assumption being that the kidney anlage itself and not the Wolffian body gives origin to the growths. The objection to both these theories of Muus and Busse's is that metaplasia plays so large a part in them. We have absolutely no proof that striped muscle fibers have ever been formed from unstriped muscle cells, and such a conception makes for chaos, instead of for the simplicity and clearness which specificity of cell origins has brought into pathology. Jenckel thinks that the kidney itself contains all the elements necessary for the development of many of these tumors, but believes that Wilms' theory must be accepted for the most complicated ones. Hedrén finds that Wilms' theory does explain most of the cases; but, in addition, he has described 2 in which he finds it necessary to modify Wilms' hypothesis by assuming that the causative error in development may occur at different periods of embryonal life, either by isolation and aberration of cell groups or complexes, or, if at so late a stage that this is no longer possible, by developmental retardation of cell groups. In this way he explained the presence of well developed glomeruli in a tumor he describes. Thus he naturally comes to the conclusion that some of these neoplasms do take their origin from the kidney itself, as Busse believes, though he cannot accept the metaplastic assumption which the latter finds necessary. Moreover, the rule that these tumors are definitely differentiated from the kidney substance points to the fact that it is not the kidney itself that gives rise to them, but that they grow from elements foreign to the kidney, present by mistake, as it were, as misplaced embryonal rudiments would be. Moreover, earlier glomeruli than those of the permanent kidney are present in the embryo, and their occurrence in these growths needs no special explanation. Trappe gives it as his opinion that the 3 cases he reports all originated in the anlage of the permanent kidney, and that the striped muscle cells sparingly present in one of them are to be explained by Busse's hypothesis of metaplasia. These tumors, according to Trappe, are really excessively proliferating malignant embryonal kidneys, and he finds *malignant nephroma* a fitting name, since it explains their pathogenesis, just as *adenosarcoma* designates their component histologic elements. With Trappe's views it is difficult to agree.

Ribbert modified Wilms' theory by assuming that buds from the epiblastic ureter are necessary for the explanation of the presence of ectodermal epithelia. Granted that such is the case, there is certainly no other hypothesis so simple and so explanatory of all these growths as is that of Wilms.

I am indebted for the operation specimens and for permission to report this case to Dr. W. A. Downes, in whose surgical service it occurred.

Dr. Leaming kindly took the photographs.

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INVESTIGATIONS UPON THE IRRITATING EFFECTS OF CATHARTIC DRUGS.*

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This inquiry suggested itself because of the common practice of giving infants and young children a cathartic drug for a more or less continuous period irrespective of the indications for its use. The conviction has grown upon me that the clinical course of some of the disorders of infancy is protracted by the excessive or untimely use of these drugs. I think there are many in a position to corroborate my experience with children who, taking calomel for a supposed gastrointestinal disorder and suffering coincidently from severe colic, mucous and diarrheal stools together with loss of weight, improve when the cathartic drug is discontinued and a rational diet encouraged. It would be absurd to decry entirely the use of laxatives in infantile therapeutics; they have their distinct indications. By a series of observations which I have made, I hope to show that this group of drugs has its therapeutic limitations and that the so-called cleaning out process should not be continued after catharsis has been established. I am convinced that such a process in itself frequently enough produces irritation. It is self-evident that after an initial dose of laxative has acted and the toxic food stuffs have been evacuated, the indication is not for more laxatives, but, first and foremost, for rest for the bowels, and, secondly, for a bland, unirritating diet which requires little or no digestion and renders putrefaction and fermentation next to impossible.

THE OBSERVATIONS.

Cathartic drugs were administered about 125 times to 22 children in the Michael Reese Hospital, Chicago, to determine, if possible, the irritating effects of average doses of the commonly employed cathartics, such as calomel, castor-oil and Epsom salts. The stools were examined before the administration of the cathartic was begun. After the cathartic had been administered in varying doses for twenty-four hours the stool was examined in the usual manner for color, odor, consistency, reaction, microscopic findings and degree of oxidation of the bile pigments. Particular stress was laid upon the presence of blood and mucus in the feces, these elements being taken as an index of the degree of irritation. In the report of cases which follows, little emphasis is put upon other findings noted in the course of the routine examination. The report would be too long drawn out and of not enough interest to give the minute details of every case.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 28, 1909.

CASE I. M. C. Wet-nurse's child. Aged three months. Normal stools before administration of cathartic. One grain of calomel, in divided doses of ¼ grain each, given on two successive days.

Second day. Stool contained free mucus; blood positive by both benzidene and Weber tests.

Third day. Mucus more finely divided; benzidene reaction strong.

Sixth day. One grain of calomel again given.

Seventh day. Much finely divided mucus; benzidene test strongly positive.

Eighth day. Mucus had nearly disappeared; benzidene test very faint.

CASE II. E. S. Malnutrition baby. Aged five months; fed on predigested milk. Stools normal before giving cathartic. One grain of calomel in $^1/_{10}$ grain doses caused no signs of irritation except a small amount of finely divided mucus. Four days later 2 grains of calomel were given in divided doses of ¼ grain each.

First day after, stool was offensive; contained much mucus; benzidene test positive.

Second day after, mucus less abundant; only a trace of blood.

Third day after, more blood than before; Weber and benzidene tests both positive.

CASE III. B. B. Mongolian idiot. Eight months old. Was given $^1/_{10}$ grain of calomel three or four times daily for nine days.

Fourth day. Stool contained no mucus; small trace of blood by benzidene test.

Eighth day. Small quantity of mucus in short shreds; trace of blood by benzidene test.

Ninth day. Mucus abundant and in free shreds; Weber and benzidene tests for blood distinctly positive.

Case IV. Bessie L. Infant. Stools were abnormal before beginning calomel; contained mucus; $^4/_{10}$ grain of calomel was given without causing any additional signs of irritation. The offensive odor was lost.

Case V. T. J. Six years old; syphilitic child. Was given calomel for twenty-four days. First two days $^1/_{10}$ grain four times daily. After this $^1/_{10}$ grain six times daily.

First day. No signs of intestinal irritation.

Second day. Small quantity of mucus in short strings.

Third day. A trace of blood by the benzidene test.

Fifth day. Free mucus much increased; positive benzidene test.

Seventh day. Stool contained much more mucus and blood; benzidene test reacted strongly, Weber faintly.

Tenth day. Much more blood; both Weber and benzidene tests reacted strongly.

Tenth to twentieth day. Mucus and blood present in greater or smaller amounts; occasionally one or both were absent.

Twentieth day. Mucus in large quantities and blood positive by benzidene and Weber tests.

Mucus and blood were found in smaller quantities until the twenty-fifth day, when calomel was stopped.

Case VI. Baby B. Stools abnormal before calomel was commenced; contained free mucus. One grain of calomel given.

First three days after calomel, stools contained considerable mucus, more finely divided than previous, but no blood.

Fifth day. Three grains of calomel given.

Sixth day. Stool contained much finely divided mucus; decided reaction by benzidene test; Weber test negative.

Seventh day. Mucus more stringy; blood reaction less marked.

Case VII. Jonas S. Five years old. Generalized eczema. Stool normal before administering calomel. One grain of calomel given on three successive nights followed by 2 drams of magnesium sulphate on the morning of the fourth day.

Second day. Stool contained small quantity of finely divided mucus; trace of blood by benzidene test.

Third day. Free mucus in large shreds; benzidene test markedly positive.

Fourth day. Day after 3 grains had been given; free mucus in strings and abundant; Weber and benzidene tests strongly positive.

Fifth day. Mucus had diminished slightly; reaction for blood with benzidene test only.

Ninth, tenth and eleventh days. One grain of calomel given each evening.

Twelfth day. Magnesium sulphate, 2 drams of saturated solution given in the morning.

Tenth day. No mucus visible microscopically; benzidene test faintly positive.

Eleventh day. Much free mucus; benzidene test strongly positive.

Twelfth day. The day after the last grain was given; stool watery; solid portion almost entirely composed of mucus; reaction for blood strongly positive by Weber and benzidene tests.

Thirteenth day. Mucus still present in quantities; both blood tests more pronounced.

Fourteenth day. Mucus less; reaction for blood less pronounced.

Fifteenth day. Weber test for blood negative; benzidene test faintly positive; mucus nearly disappeared; was finely divided.

CASE VIII. B. D. Eighteen months old. Three and one-half grains calomel in three days.

Fourth day. Stool formed, accompanied by discharge of much brownish fluid, with considerable free stringy mucus; reaction for blood positive with benzidene test; negative with Weber test.

CASE IX. S. S. Nine months old. Malnutrition infant. Fed on predigested milk; stools normal before administration of cathartic. Was given 1 dram of saturated solution of magnesium sulphate for three successive days.

Second day. Stool contained neither blood nor mucus.

Third day. Trace of blood by benzidene test; no mucus.

Fourth day. Benzidene test reaction for blood markedly positive; no mucus seen macroscopically.

Fifth day. Stool seemed normal, except for a faint benzidene reaction.

CASE X. L. S. Ten months old. A malnutrition baby. Stools normal before beginning test. One dram of saturated solution of magnesium sulphate was given for three successive days.

Second day. Stool soft; contained mucous shreds; no blood.

Third day. Stool semi-solid; much free mucus, and a trace of blood by benzidene test.

Fourth day. Mucus less abundant; benzidene reaction more sharply marked; Weber test negative.

Case XI. John B. Nine months old. Malnutrition infant. Stools normal before beginning observation. One dram saturated solution of magnesium sulphate for three successive days.

Second and third days. Stools unchanged; contained neither blood nor mucus.

Fourth day. No mucus visible macroscopically; benzidene reaction for blood positive; Weber test negative.

Case XII. Mary W. Healthy baby eight months old. Breast-fed, normal stool. One dram of saturated solution of magnesium sulphate given.

Second and third days. Small quantity of free mucus; no blood by either test.

Case XIII. Gus. J. Four months old. Healthy infant; breast-fed. Stools normal before administering cathartic. One dram saturated solution of magnesium sulphate given.

Second and third days. Stool normal; contained neither blood nor mucus.

Case XIV. Pearl B. Nine months old. Stools normal. Was given 1 dram of castor-oil.

Second and third days. No mucus present; reaction for blood negative.

Case XV. L. R. Eleven months old. Normal baby; normal stools. One dram of castor-oil given.

Second and third days. No mucus present; reaction for blood negative by both tests.

Case XVI. George S. Two years old. Malnutrition baby. Two drams of castor-oil given.

Second and third days. Stool contained neither blood nor mucus.

Case XVII. Gerald S. Chorea. Five years old. Stool watery and offensive before administering cathartic. Three drams of castor-oil given at one dose.

Second and third days. Stool has improved, odor less offensive, better consistency; no blood or mucus.

CASE XVIII. M. M. Six months old. Normal stool. One dram of castor-oil given.

Second and third days. Small quantity finely divided mucus; trace of blood by benzidene test.

CASE XIX. S. D. One year old. Bronchopneumonia. Stool undigested and contained much stringy mucus. One dram of castor-oil given.

Second and third days. Condition of stools improved; mucus less abundant and more finely divided; no blood present.

CASE XX. H. E. Sixteen months old. Cervical adenitis and lobar pneumonia. Stools contained mucus before beginning cathartic. Two drams of castor-oil given.

First day. Four hours after giving oil much stringy mucus; benzidene reaction faintly positive.

Second day. Free mucus abundant; strongly positive benzidene test for blood.

CASE XXI. M. W. Eight months old. Healthy infant; normal stool. One dram of castor-oil for three successive nights.

Second and third days. Stools unformed; contained neither blood nor mucus.

Fourth day. Small quantity of finely divided mucus; faint trace of blood by the benzidene test.

CASE XXII. S. S. Ten months old. Malnutrition infant. Stool before beginning observations clay-colored, but contained no blood or mucus. One dram of castor-oil given.

Second day. Stools unformed, otherwise unchanged.

Third day. Stools unformed, otherwise unchanged.

Fourth day. Small amount of free mucus; positive benzidene test for blood; Weber test negative.

OTHER OBSERVATIONS ON EXAMINATION OF FECES.

As has already been stated, the observations which follow are not given in detail, but are mentioned herewith in condensed form.

(1) *Color.*—In most cases unaffected. Green stools especially after calomel. Those which were at first yellow occasionally became dark brown or mottled. Several observations show that stools of abnormal color became normal in color with any of the cathartics used.

(2) *Odor.*—The most frequent observation in reference to

the odor was that an offensive stool became less offensive. Occasionally it occurred that the stool became more offensive after the use of the cathartic, and this was particularly true of the calomel.

(3) *Consistency.*—In consistency the stools were rendered, for the most part, softer, but seldom watery.

(4) *Reaction.*—In regard to the chemical reaction of the stools, the majority were faintly acid before the cathartics were given and were unaffected by the laxatives. Occasionally an alkaline stool was met with.

(5) The microscopic findings were, for the most part, constant. No blood corpuscles were found in any stool. After catharsis had been established, epithelial cells were increased and were found imbedded in masses of mucus. They were frequently bile stained.

(6) *Bile Pigments.*—Unoxidized bile pigment was found in many cases before and after the cathartic was given. The quantity was usually larger after catharsis. Calomel seemed to produce the most marked effects on oxidized bile pigment when present.

(7) The effect of calomel upon the bacterial contents was determined in 1 case. Four days after 1 grain of calomel was given the bacteria numbered 210,400,000 bacteria per gram of feces. On the next day, after 3 grains of calomel the count rose to 762,300,000—decreasing two days later to 170,000,000, increasing on the following day to 276,300,000.

RÉSUMÉ.

(1) Calomel was given to 8 children, 60 stools being examined.

(2) The children who received 1 grain of calomel, either singly or in divided doses, showed irritative effects on the following day, as evidenced by the presence of mucus and occasionally of blood.

(3) Those who received 2 or 3 grains of calomel at one dose showed both blood and mucus the following day; this finding persisted for two to three days after the discontinuance of the cathartic.

(4) In cases where calomel was given in daily divided doses ($^1/_{10}$ grain per dose) for a consecutive number of days, the reaction for mucus and blood increased in intensity from day to day.

(5) Magnesium sulphate was given to 5 children; 18 stools were examined. Small single doses, as 1 dram of the saturated solution produced slight irritation, *i.e.*, small quantity of mucus, but no blood.

(6) Large doses of magnesium sulphate (1 dram of saturated solution for three successive days) showed at the conclusion of the third dose a reaction for blood by the benzidene test and considerable mucus, though not as much as was produced by repeated doses of calomel.

(7) Castor-oil was given to 9 children, 26 stools being examined. Single dram doses of castor-oil produced no irritation, except a slight reaction in 1 case. Two drams given at one dose to older children caused the reaction of irritation in 1 case; another case showed no irritation in the stools.

(8) Castor-oil was given to 2 children in dram doses for three successive nights. Both stools showed the reactions of irritation after the third dose.

(9) All three cathartics under observation are capable of producing signs of irritation if the dose be sufficiently large or given for a continuous period of time. Of the three drugs under observation calomel seemed capable of producing the greatest irritation with average doses in the shortest possible time. Castor-oil seemed to cause the least reaction.

I am indebted to Dr. Mark Jampolis, of Chicago, for his painstaking and diligent labor in carrying out the analyses enumerated above, and also to Dr. Con. Jacobsen for helpful suggestions and chemical and bacteriologic reports of specimens submitted.

BLOOD TESTS.

A piece of feces about the size of a large lima bean is mixed with a small amount of water. The fat is then extracted by shaking with a small amount of ether, which is poured off. About 2 c.c. of glacial acetic acid and 5 c.c. of ether are then added to the stool and the mixture again shaken. After settling, the acid-ether extract is poured off and used for the Weber and benzidene tests.

Weber Test.—To one-half this mixture about 15 drops of a fresh tincture of guaiac and about 2 c.c. of hydrogen peroxide are added. In the presence of blood the mixture turns blue, the intensity of the color varying with the amount of blood.

Benzidene Test.—(Test of O. and R. Adler.) The benzidene test was performed in the same way, 15 drops of a solution of Merck's benzidene in acetic acid being added instead of the tincture of guaiac. As in the Weber test the color in blue varies in intensity with the amount of blood. Benzidene test is about eight times as sensitive as the guaiac test.

(Described in *Zeitsch. für Phys. Chem.*, 1904.)

DISCUSSION.

DR. MORSE.—I am glad to have Dr. Abt prove by observation what I have been coming to believe for some time, that calomel is a comparatively dangerous drug and that castor-oil is much safer. The average physician is, I think, in the habit of giving too many cathartics in disturbances of the intestinal tract.

DR. SOUTHWORTH.—I would like to say a word in favor of calomel. We have been in the habit at the out-patient department of the Babies' Hospital of dispensing broken doses of calomel in tablet form. I have used a great many thousands, probably tens of thousands, and I have never been convinced that any harm was done by it when employed rationally.

DR. ADAMS.—I believe in giving calomel, but I believe a great deal of confusion arises from the fact that the doctor often gives calomel before making the diagnosis. The first thing the average practitioner does on seeing a case is to write a prescription for calomel. I made that statement at a meeting of physicians when an enthusiastic young physician got up to squelch me and said such a charge was unfair to a great profession and was not true. I said, "There are thirty-five men here; will one who doesn't do this hold up his hand?" and not one held up his hand. The diagnosis is often confused by such a procedure.

DR. BLACKADER.—This subject of cathartics is of interest to all of us. In these days of therapeutic nihilism, purgatives form the most frequently employed class of drugs; many who have thrown overboard almost all other classes of drugs still employ members of this group in a more or less modified way. The facts brought out by this paper of Dr. Abt's are, therefore, of great interest to all. The doctor has chosen the three purgatives which are regarded as the least irritating. In his employment of them my only criticism is that the dose of magnesium sulphate was a drastic one for an infant. Pharmacologists recognize that all cathartics are more or less irritating to the mucous membranes of the intestinal tract, inducing increased secretion and increased peristalsis, with a lessened capacity for absorption. I do not think the question of how much irritation is produced by our cathartics has ever before been investigated by examination of the feces. A slight increase in the amount of mucus, with the appearance of a few red blood cells, may or may not be of importance. It would be interesting to investigate the action of our other cathartics and perhaps to inquire whether all conditions which induce an irritative action in the bowel are not accompanied by the appearance of red cells.

The paper is a very valuable one and a very timely one.

DR. ROTCH.—I have always made it a practice to give very little calomel. I think it is given unnecessarily many times. In comparing my cases with those of others who give calomel I cannot see but that my cases do just about as well. It is very seldom that I give calomel, especially in the early years. I rely much more upon the management of the food.

DR. ABT (closing remarks).—I may say that I was led to carry out these observations, because I was impressed with the fact that these drugs were abused and over-used in practice. I am now convinced that small doses of non-irritating cathartics will act quite as well, or better, than long continued or excessive doses of calomel.

As to Dr. Blackader's remark about dram doses of magnesium sulphate being large for a child, I should say that I used dram doses of saturated solution of Epsom salts.

INSUFFICIENCY OF THE SUPRARENAL CAPSULES IN SCARLATINA.—V. Hutinel (*Bull. Méd.,* March 17, 1909) says that there are cases of various diseases with symptoms of marked asthenia and circulatory troubles that would indicate insufficiency of the suprarenals, and other cases in which alteration of the capsules is found postmortem. These symptoms are seen in some fatal cases of scarlatina. We may judge that they are caused by lesions of the suprarenals produced by the poison of the disease. The symptoms are marked prostration, cardiac insufficiency occurring in crises, hypotension of the arteries, tendency to syncope, and pigmentation of the skin. The author describes an interesting case in which these symptoms were relieved by the injection of small doses of adrenalin, and the patient recovered. He believes that these cases of sudden death without any apparent cause are due to lesions of the suprarenal capsules which cause the abdominal pains of which the patients complain.—*American Journal of Obstetrics.*

A CASE OF CEREBRAL HEMORRHAGE (BIRTH), WITH OPERATION.*

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Of the unrecognized causes of death at birth, cerebral hemorrhage undoubtedly affords a considerable percentage. The cases of hemorrhage surviving the act of parturition offer a symptom-complex readily appreciated by the obstetrical specialist and less and less overlooked by the general practitioner functionating as accoucheur. As tradition and usage have made the obstetrician a pediatrist for four weeks, those of us who affect the latter title as a working *nom de plume* see only the pathetic picture of psychical and physical impairment and blasted parental hopes.

It is not my purpose to "carry coals to Newcastle" in outlining a familiar picture of either the early or late manifestations of this accident or invite maledictions for again spinning out a many times reiterated bibliography, but I wish, with the emphasis always guaranteed an individual experience, to call your attention to the only measure that has been followed by any degree of success in such cases, namely, operative interference, and to show where, in case of failure, the cause of failure lay.

On February 17th, late in the afternoon, Mrs. M. B. went into labor. She was thirty-five years old. The present was her first pregnancy and it had been uneventful. The pelvic measurements were liberal and promised no obstruction. Her labor was very slow and the first stage was not completed at the end of forty-six hours. During this time the uterus seemed to have no driving force at all and the only result of the pains was increasing fatigue. I decided to force the labor at once. The cervix was at that time three fingers dilated, having made no advance for some time. Champétier de Rives bags were inserted, the cervix dilated and then, after catheterization and chloroform anesthesia, the forceps were applied.

The head was engaged, but high in the pelvic canal. The instrumentation lasted an hour, no help being afforded by uterine contractions. The forceps were not taken off during this time, but frequently unlocked to relieve pressure.

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* Read before the Twenty-first Annual Meeting of the American Pediatric Society, Lenox, Mass., May 27, 1909.

When the head was brought down on the perineum the fetal heart was so weak that it became evident that either the fetus or the perineum must be sacrificed and the latter was chosen.

The perineum was torn to the second degree. The cord was once about the body and the child was deeply asphyxiated. The child was, however, resuscitated by slapping and applying cold water to the nape of the neck and blowing upon the neck and face. At last it cried and later became ruddy, a perfectly good color. It is seen that the common method of resuscitation by artificial respiration by doubling up the child was avoided, as this procedure can but increase the pressure within the cerebral vessel, which have already been submitted to such an extraordinary strain.

The placenta was expelled by the Crédé method after forty minutes with membranes intact and no postpartum hemorrhage ensued. The perineum was repaired, but all the stitches came away, no effort at healing being evident for nearly two weeks.

Here certainly were two potent factors in the induction of birth hemorrhage, prolonged labor and instrumentation.

The child showed superficial excoriations over the left ear and neck and right eye. There were extensive hematomata of the parietal regions of both sides.

The position had been R. O. A. The delivery had been accomplished at 3:30 P.M. That evening the child showed a peripheral facial palsy of the left side, being unable to close the left eye and displaying a marked flattening of the left side of the face and drew the mouth well to the right on crying.

The next morning the eye could be closed and the facial palsy was less marked, but the left arm was found very rigid and the hand dorsally flexed at the wrist, the hand approximating the position of *main en griffe.* The left leg was also rigid and the foot sharply flexed dorsally. The knee-jerk on that side was greatly exaggerated. That evening the condition of the left side was the same and convulsive movements, especially of the upper part of the body, were manifest, with marked shrugging movements.

The color was still good at this time, thirty hours after birth, and the pulse still strong, an important point to note. The child cried a great deal that day.

By the next morning a decided change had taken place. The child looked badly and was cyanotic. It was decided to have recourse to an operation, and Dr. Alfred S. Taylor was called in, whose report on the procedure and discussion from the surgeon's standpoint follows.

In this case the operation consisted in turning down an osteoplastic flap, which comprised most of the parietal bone of the right side, with the attached base just above the ear. A slightly smaller dural flap was turned down, exposing the surface of the brain covered by blood clot. This clot covered not only the whole area exposed, but also extended beyond the cut edge of the dura on all sides. It was comparatively thin, superiorly and posteriorly (about $^1/_{16}$ inch), but became thicker toward the lower anterior angle of the wound at the beginning of the fissure of Sylvius. At this point active bleeding was present, but whether it was a part of the original process or the result of operative interference could not be definitely determined.

All of the clot that could be reached was gently removed, the brain surface was irrigated with warm saline solution, and the fresh hemorrhage was controlled.

The dura was closed by a continuous catgut suture; the osteoplastic flap was laid back in place, and the periosteum was sutured with chromic catgut; the scalp wound was closed by a continuous suture of silk. Sterile dressings were applied and the patient returned to bed.

In spite of the removal of the clot there was no improvement in the baby's condition, and about a half hour later death occurred.

Postmortem examination of the brain revealed that in addition to the clot removed at the time of operation, an extension of it passed along the inner end of the fissure of Sylvius to the base of the brain, backward beneath the right temporo-sphenoidal and occipital lobes, well forward beneath and between the frontal lobes, over into the beginning of the left fissure of Sylvius, backward beneath the left temporo-sphenoidal lobe, and finally down into the posterior fossa of the skull, where the anterior surfaces of the pons, the medulla, the cerebellum and the spaces between them were covered with thick clot.

The last-described portion of clot undoubtedly caused death by pressing upon the vital centers.

The whole convex surface of the brain was markedly congested, more especially upon the right hemisphere.

While it cannot be determined just when the clot made its appearance in the posterior fossa, nor just when it formed, the continuity of this clot with that in the middle fossa, and the fact that the signs of pressure upon the vital centers in the medulla appeared only during the very last few hours of life, justify the belief that it was crowded down from the middle fossa as a result of the increasing pressure there present.

If this assumption be granted, this case very strongly emphasizes the fact that, if operation is to succeed in these cases, it must be undertaken at the earliest moment the diagnosis can be made.

DISCUSSION.

DR. TAYLOR.—The specimen (exhibited) shows very clearly the beginning of a hemorrhage around the Silvian fissure; its extension up on the cerebral surface is not so evident. The extension of the clot, however, through the fissure toward the base of the brain, under the frontal lobes, and backward under the temporosphenoidal and occipital lobes, and the marked extension downward behind the sella turcica, is very definite and the clot is absolutely continuous with no break, so that we felt justified in assuming that the hemorrhage occurred at the Silvian fissure. The focal symptoms in relation to the arm appeared first. The relief of pressure on the cerebrum prevented further convulsive movements. The symptoms, with relation to pressure upon the bulb. were uninfluenced; they continued with increasing severity until the child ceased to breathe.

In doing an operation for the relief of fresh hemorrhage it is important that the operation be as brief as possible and that the interference should cause the minimum amount of traumatism to the brain tissue. The traumatism which has already occurred causes the brain to be very easily injured, and in cutting through the bone one cannot use rough measures without producing further traumatism to the cerebral structures. One cannot use the scalpel for fear of cutting through the dura. The saw cannot be used for the same reason. Strong blunt scissors are recommended by Cushing. (Dr. Taylor exhibited instruments devised by him for this operation, with which injury to the brain substance he thought was less likely to occur.)

The cases naturally which are best for operating are those where the clot is confined to the upper surface of the brain, because there you get a good deal of exposure and can remove the clot. These hemorrhages are practically always on the lateral or midportion, under the parietal bone, and cause pressure on the motor area, so that motor irritation is an indication for operation. Where the clot is on the base of the brain the symptoms are those of pressure on the vital centers. In these the prospects are not so good. One cannot handle the soft, delicate brain with sufficient ease to make sure of getting out all the clot without doing injury to the cranial nerves. There is also the serious question of whether such a child, if it were to live, would be a useful member of the community, because there might still be enough clot to cause interference with function.

Operative procedure, to be successful, should be undertaken at the earliest moment, as at that time there is the least amount of injury from the hemorrhage and the child has the best resistance.

DR. LA FÉTRA.—I desire to emphasize the fact that when the cord is around the neck one has to be all the more on the watch for symptoms of cerebral hemorrhage occurring a shorter or longer time after birth. I had occasion last year to look up a number of records of cerebral hemorrhage, and in a large number of the cases the cord had been around the neck.

DR. KOPLIK.—It must be very difficult with some of these children to decide whether operation should be done or not for two reasons. We all know that a great many of these children grow up in a deficient state mentally and physically, but we also know that a great many of these infants do not. I have in mind one child in whom there were all the symptoms of hemorrhage, and still the child is today a most beautiful girl with no bad symptoms whatever. So it is a matter for grave consideration whether to undertake the operation or not.

DR. MORSE.—It has been my misfortune to see a number of these cases during the past winter, and I have been struck with the irregularity of the symptoms and with the late development of the symptoms in some of them. I had previously supposed that they came on within the first twelve hours, but have recently seen cases in which they did not appear until the third or fourth day.

It must also be remembered that other conditions may give rise to symptoms very similar to those of cerebral hemorrhage. Even the motor symptoms may be due to conditions entirely outside the head, gastrointestinal, for instance.

Personally, I feel very cautious about making the diagnosis and recommending an operation. It is a very serious thing to recommend an operation as grave as this when a dose of castor-oil would cure the trouble.

The symptom which I have found most constant is bulging of the fontanel. If the fontanel bulges there is almost certainly a hemorrhage. Another symptom which I have seen in nearly all of my cases has been bleeding from the nose or back of the throat, the blood presumably coming through the cribriform plate. Another means of diagnosis is, of course, lumbar puncture. A bloody fluid points strongly to cerebral hemorrhage, but is not conclusive evidence, as the blood may come from a wounded vein. Too much reliance cannot be placed on it therefore.

Even when you have made up your mind that there is a hemorrhage it is difficult to decide on which side of the brain the hemorrhage has occurred and as to whether it is cortical or at the base. Dr. F. T. Murphy has called attention to the presence of a bluish color showing through the fontanel after the deflection of the scalp as being of some importance in localizing the clot. Another difficulty is in determining whether, after the clot has been found and removed, all the hemorrhage has been found or whether there has been another somewhere else.

I have been much impressed with the difficulties and dangers of the operation, and the more I see of these cases the more surprised I am at Dr. Cushing's results in his first series.

DR. HOLT.—When one sees these children when they are twelve or fourteen months old, or later, with spastic paraplegia and mental defects, one feels justified in attempting almost anything, and yet I feel very much with Dr. Morse that the difficulties of diagnosis and operation are great. In the first place, nearly all these hemorrhages are diffuse and one cannot be sure he is getting all the clot out.

I think, also, that bulging of the fontanel is the best single symptom in diagnosis. A slow pulse is also significant. No importance, however, should be attached to obtaining bloody fluid by lumbar puncture. We get that every now and then in puncture in all sorts of conditions. To be certain of our diagnosis we should have localized symptoms, hemiplegia or convulsions of one side.

I have seen several cases that had very high temperature. One child we watched very closely, and for four or five days its life was despaired of; temperature, 105°F. for two or three days. I have known other cases with fairly marked symptoms to come to operation and nothing found. One such case I saw recently which Dr. Cushing operated on. The symptoms were of a general character, recurring convulsions and rigidity. I think that we are really very much in the dark at the present time, and, considering the danger of operation and the difficulties of diagnosis. I am not very hopeful as to the benefits to be derived, though I should feel like having the operation done in every case in which there were focal symptoms.

DR. MILLER reported a case seen by him the past summer. Six days after birth the child was seized with general convulsions and rigidity, which lasted five days. During the remainder of its life it would have retraction of the head, amounting, at times, to opisthotonos whenever it was irritated or excited. Then it contracted whooping-cough, and died at eight months. Dr. Spiller saw the case a couple of times, and was of the opinion that there had been, possibly, a hemorrhage of the brain. The child came to autopsy, and the brain was macroscopically normal, but the microscope showed diffuse meningitis. The child presented all the symptoms of a diffuse hemorrhage, although none was present.

Dr. Freeman.—In connection with the remarks concerning the symptom of bulging of the fontanel, I would speak of a case I saw a short time age, where the child had such bulging, with focal symptoms, and operation was advised but refused. I saw the child afterward and it had improved very much, the symptoms having practically disappeared.

Dr. Churchill.—When we consider what happens to most of these children who live I feel, with Dr. Holt, that one is justified in advising almost anything, and, personally, if I had a child in this condition, I should insist upon having the operation done. As I remember Dr. Cushing's paper, the 2 cases surviving were recognized and operated upon early, while the 2 that died were not operated upon until after a considerable time. I happen to have seen 4 of these cases during this last winter, all in consultation; 3 of them were moribund; the fourth we might have operated on if the parents had been willing, but they were not; and even the attending physician was very lukewarm about it. There should be a campaign of education carried on concerning this subject, pointing out that physicians should be very careful in looking for cerebral symptoms in cases of difficult labor, and that at the first sign of such symptoms a surgeon should be called in for an opinion.

Dr. Hamill.—I am quite in sympathy with what Dr. Holt has said as to the difficulty of diagnosing these cases. I have seen quite a number and have followed many of them to the autopsy table. Some cases, which have closely simulated this condition, have shown no evidence of hemorrhage at the autopsy. In cases with definite localizing symptoms I have had no difficulty in making a correct diagnosis; it has been in the cases where these did not exist that errors have occurred. In the cases reported there were localizing symptoms; and, as I understood the paper, it was in cases of this sort only that Drs. Meara and Taylor considered the operation justifiable.

Dr. Howland.—Even when there is a mistake in diagnosis in these cases it does not mean that the operation is necessarily fatal. In one of Dr. Cushing's cases he went in on one side and found nothing; went through the other parietal bone and found nothing; went through the occipital bone and found nothing; and yet the child's condition was not prejudicially affected even by such an extensive operation.

DR. KERLEY.—I hope some day that we will have better means of diagnosis in these cases. I had a case recently where three days after birth the child had convulsions and complete hemiplegia. The child was seen by different men, each of whom made a fatal prognosis, but the child recovered perfectly. In this case all the symptoms spoken of were present.

DR. TAYLOR (closing remarks).—I would not like the members to think that we supposed every case should be operated upon. We want to make it clear that it is in the cases of focal lesion that the opportunity for recovery is best. In a subject like this, where surgical intervention is a new thing, it is necessary that the subject should be brought up frequently, just as it was in the case of the surgery of the appendix. Some men thought every child should lose its appendix lest appendicitis should develop later; other men thought they should not be operated on at all. Now we are all pretty well agreed as to the indications for that operation, and so it will be with this condition after a while. In some, operation is indicated from the very start, because it offers the only hope. There are others which are debatable, and it is in these that a discussion of the differences of opinion will put us upon the right track. As to the danger of the operation itself, it is apt to be magnified. The impression is abroad that the young child doesn't stand operation well; that is incorrect.

DR. MEARA (closing).—We think we have sufficient anatomic evidence to show that the delay permitted further leakage and pressure on the vital centers.

HEMORRHOIDS IN CHILDREN.—Denis G. Zesas (*Arch. Gén. de Chir.,* October 25, 1908) describes hemorrhoids as occurring rarely in children, but still being found. Heredity is an important factor in their causation, there being a congenital thinness of the mucous membrane of the anorectal region, with a corresponding thinness and weakness of the vessel walls. The venous walls are insufficient to support the column of blood in the hemorrhoidal veins, and the hemorrhoids appear as bluish tumors about the anus. Constipation is a factor in many cases, and a chronic diarrhea may have the same effect on the veins. Occasionally tumors in the abdomen, or an enlarged liver, may be the cause of this condition. Infection from a simple ulcer of the subsphincteric region or from excoriations of the anus cause hemorrhoids. There is no difficulty in the diagnosis. Treatment is the same as in the adult, the Miculicz operation giving the best results.—*American Journal of Obstetrics.*

MISCELLANY.

THE FIFTEENTH INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY.

The following letter and syllabus seem of such importance that the editors desire to bring them to the notice of the readers of the ARCHIVES and to urge upon them the desirability of reporting to the secretary any work which they may be doing along the lines indicated:—

1 Madison Avenue, New York City,
October 15, 1909.

DEAR DR. LA FÉTRA:—

On the invitation of the Department of State of the United States Government, the Fifteenth International Congress on Hygiene and Demography will convene for the first time on the American continent in Washington, D. C., from September 26 to October 1, 1910. Section III. of this Congress deals with the subjects of the Hygiene of Infancy and Childhood: School Hygiene. It is believed that this will be a meeting of the utmost importance.

We take this means of requesting your readers to let us know of any pieces of original work which are being done bearing upon this topic. The general ground to be covered by this Section is indicated by the enclosed rubric.

Sincerely yours,
A. JACOBI,
President.
LUTHER H. GULICK,
Secretary.

The following topics are suggested for discussion:—

I.—THE HYGIENE OF THE HOME.

The hygiene of the suckling. The hygiene of city babies. The hygiene of growth—physical development—feeding of children. Anthropometry.

II.—THE HYGIENE OF THE SCHOOL CHILD.

Cleanliness of body: hair, teeth, nails. Cleanliness of dress. Walk to and from school—the carrying of school books. Length of period of sleep. Breakfast—lunch—nature and amount of food—number of meals. Influence of local or national habits. Effects of over and underfeeding on the child and on the population.

III.—THE HYGIENE OF THE SCHOOL BUILDING.

The School Building. — Plumbing — water supply — drinking facilities—inspection. Care of entrances, stairs, halls, rooms—dust—methods of cleaning.

The School Room.—Lighting—natural and artificial light—minimum of light required—location of windows. Heating. Atmosphere—impurities—humidity—temperature. Ventilation through porous walls, windows, doors—utilization of drafts of air—disposal of smoke—mechanical ventilation. Furniture—distribution of school desks in a room—adjustable school furniture.

Other Rooms and Localities.—Lavatories — arrangements for washing, towels, soap. Toilets—location—ventilation—care of. Gymnasiums. School yards—covered—open. Baths—shower baths—swimming tank. Luncheon rooms. Cloak rooms.

Medical inspection of the school building. Precautions against fire.

IV.—HYGIENE OF INSTRUCTION.

Fatigue: The validity of fatigue tests as applied to school children—the erograph. Individual differences in mental capacity—race differences. Individual differences in physical capacity and development — variability of capacity. Physical and psychic differences in the sexes—coeducation. Methods of instruction. Instruction in the kindergarten—the beginning of school life. Number of pupils to a class Length of the school day. Curriculum: Length of periods—sequence of studies—the place of physical training in the curriculum—the place of instruction in hygiene—influence of the schedule upon the efficiency of the pupil. Reading, writing, drawing: The effects upon eyesight—size of type—writing materials—rules for writing—vertical, Spencerian handwriting. Home work—hours of study by age and sex. Examinations—the effect of examinations. Punishments. Recesses —number and length of recesses by age and sex. The relative value of prolonged and of brief absences. Laggards. Special classes or schools for the mentally defective, the physically backward and diseased. Vacations—

holidays—school work for holidays and over Sundays. Domestic work and child labor (factories) in relation to age and to physical development.

V.—HYGIENE, WITH REFERENCE TO PHYSICAL DEFECTS.

Normal and abnormal anatomic evolution. The physiology of infancy and of childhood. Normal and morbific inheritance. Medical inspection of school children for remnants of contagious diseases—inspection as conducted by boards of health and boards of education—the law in Massachusetts—inspection as to size, weight. Defective eyesight—myopia. Defective hearing. Difficulties in speech. Scoliosis. Diseases of the nose and throat—enlarged glands, adenoids, hypertrophied tonsils. Pediculosis. Diseases of the skin. Dental hygiene. Nervous and psychic disorders. Headaches—habits—chorea, tic, hysteria, epilepsy—mentally subnormal children—suicides—causes of abnormal psychic states. Sexual perversions.

VI.—THE HYGIENE OF THE TEACHER.

The effect of the teacher upon the school child—personality—temperament.

VII.—THE HYGIENE OF OPEN AIR SCHOOLS.

The effect of open air schools upon tubercular children. What is being done in Boston, Providence, New York, and in other places.

VIII.—OUT OF SCHOOL HYGIENE.

The value of summer camps—of school gardens. Walking expeditions for city children.

IX.—MUNICIPAL HYGIENE WITH REFERENCE TO CHILDREN.

Hygienic measures to adapt the city to children's health. Playgrounds—roofs—parks. How to make better use of parks for children.

X.—PROPAGANDA OF CHILD HYGIENE.

Instruction of mothers through school physicians. Instruction in hygiene in the public schools. The formation of health habits among children. The education of the community through the daily press. Public meetings in the interest of health. The use of official leaflets for general distribution.

LUTHER H. GULICK, M.D.,
Secretary, Section III.

1 Madison Avenue, New York City.

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS.

Stated Meeting, held October 14, 1909.

Dr. Eli Long, Chairman.

A CASE OF PYLORIC STENOSIS, CURED WITHOUT OPERATION.

Dr. Linnaeus E. La Fétra presented a male infant, nine months old, the only child of Jewish parents. The child was born at full term. He was breast-fed until his admission to the Babies' Hospital on June 15th. The baby vomited from fifteen to twenty times a day, usually just after, but always between, feedings. It was projectile in character. He was always constipated. There was a constant loss of weight from birth. The peristaltic wave was not noted at first because of the tense abdomen and some abdominal tenderness. The child was at first thought to be suffering from pylorospasm. Four days after admission, June 19th, the peristaltic waves were first seen and felt, and they became very marked up to June 30th. The waves could be seen across the room, and the thickened wall of the stomach could be picked up between the fingers. The "spool" of thickened pylorus was easily made out. Only once had Dr. La Fétra seen any such peristaltic waves in a case other than pyloric stenosis with marked vomiting. That child was a Mongol, one year old. The mother had noticed a peculiar swelling on the abdomen when the child was given a bath. There was no more vomiting than occurred in normal babies. The wave was marked, the stomach was thick, and the artery on the greater curvature could be felt pulsating.

The child presented by Dr. La Fétra was admitted to the hospital when five months old, on June 15, 1909. The weight was 7 pounds, 14 ounces. The stomach was washed out and modified food given. On the day following he vomited two or three times. Sodium bromid, 2½ grains at each feeding, was given. On the 30th, 1 minim of paregoric was added. From July 7th the baby was breast-fed, and the same medicines continued. The child had projectile vomiting only every second or third day. On August 4th, 2 ounces of junket were given three times a day. There was practically no vomiting, but the infant lost weight. On August 7th the amount of paregoric was increased to 3 minims, and about 1 dram of milk of magnesia was given each night. All this time, notwithstanding the breast milk, there was a loss in weight, which on August 12th was down to 7 pounds, 2 ounces. On August 19th the paregoric was increased to 6 minims, and the sodium bromid to 4 grains seven times a day. By September 22d there was no vomiting, and the above medication was stopped. On September 27th the child developed a bronchopneumonia; having a temperature of from 101° to 103.5° F. for ten days. There was no vomiting. Since October 6th the temperature had been normal, the stools normal, and the baby vomited only occasionally. The weight had increased to 10 pounds, 3 ounces.

Dr. La Fétra reported 2 other cases cured without operation. Also 3 operated cases, all dying. In his last case, operated upon by Dr. A. S. Taylor, the pylorus was found very hard as well as thickened. The walls were 3/8 inches thick and the tissues so friable that sutures would not hold. For such cases operation was the only hope and even then the chances were slight because of the difficulties of the operation. The cases of hypertrophic pyloric stenosis differed so much that no general rule could be laid down as to medical or operative treatment. Breast milk was of the first importance and might be all that was needed; sedatives, especially opium, should be used in full doses (the case presented took over 1/6 grain of opium daily). Lavage and poultices over the stomach are of value. If scanty urine and meconium-like stools persist and the infant loses weight steadily, operation should be considered. After operation the feeding should be very cautiously watched, lest the infant be poisoned by overfeeding.

Dr. Alfred S. Taylor reported a case of pyloric stenosis that he had operated for Dr. La Fétra, and presented the specimen of the stomach. The child was six weeks of age, and had vomited persistently from the time of birth. The child was brought to New York City from the far West. The classical symptoms of pyloric stenosis were present in this case. One could feel the hardened pylorus, and the peristaltic waves of the stomach could be seen and felt with perfect clearness. After a delay of about twelve hours it was decided that an operation should be performed. The operation was done last August. The operation was slightly different from the one usually described. Dr. Taylor said he had been doing some experimenting with the pylorus with the idea of adopting a scheme suggested by either Dr. Abbe or Dr. Holt, splitting the pylorus longitudinally through the serous and muscular layers and then doing a suture similar to that of Mikulicz; by so doing there was no chance of contaminating the peritoneal cavity. The pyloric opening was readily enlarged. When it was decided to perform this operation, because the child was in such a bad state of nutrition, it was thought desirable to do an enterostomy in the upper jejunum and to feed the child through a tube. The pylorus was easily exposed; it was hard as an ivory button; its muscle was very thick and friable, the sutures tearing through. Finally a diamond-shaped segment of the pylorus was removed down to the mucous membrane and the wound sutured as above stated. He succeeded in getting a good-sized pyloric opening. He then did an enterostomy in the jejunum, sutured in the feeding tube and sent the child back to the ward. The infant was fed every two hours. On the day following the operation, the child suddenly collapsed and died.

The specimen was secured, showing the great thickness of the pyloric wall. The sutures had held all right. The lumen of the pylorus was sufficiently large, as large as an ordinary lead pencil, to allow food to pass through with ease.

Dr. Charles Herrman reported a case of pyloric stenosis cured without operation. The infant was breast-fed, and the mother came to the hospital three times a day to feed her infant; nursing it from one breast. The milk was then drawn from the other breast and given three hours later. In three weeks the child lost only 1 pound in weight. With such a slight loss in that length of time, operation certainly was not indicated. The child soon left the hospital, the vomiting ceased and the child to-day was improving very rapidly.

Dr. Herrman said there was one point in connection with these cases that was worth mentioning: that the symptoms of pyloric stenosis did not appear at or shortly after birth, but after some weeks had elapsed. Westphal had tested the electrical reactions in the newborn and he had found that these reactions for the first few weeks of life were very much diminished in the peripheral nerves. If the symptoms of pyloric stenosis were dependent upon increased reflex irritability, this peculiarity might explain why the symptoms were not present during the first few weeks of life.

Dr. Charles Gilmore Kerley said that the one very important point for consideration in any case of pyloric stenosis was, when the operation was necessary. He had observed 3 cases, one being the one shown by Dr. Le Fétra, which had gotten well without operation. He was inclined to believe that operation is sometimes performed too early; but on the other hand, if the operation were delayed too long the resulting malnutrition made the operation more hazardous. He felt that it was a most difficult matter to decide just when the operation should be performed. Because of the high mortality there should be no interference until it was demonstrated that the child's condition would be hopeless without the operation.

These cases did particularly well on breast milk. All 3 of his cases had been treated in this way. In 2, stomach washing had been done frequently and no medication had been given; 1 was well at the end of one and one-half years, and the other had practically ceased vomiting, but the case still showed the stomach wave.

Dr. L. E. La Fétra said in regard to the time for operating in such cases, that one should not operate at all if it was possible to avoid it; but in the case referred to Dr. Taylor, nothing but an operation could have saved the baby. In another case the child was breast-fed for weeks, and continued to lose weight. Operation was at last performed, and it was learned that it would have been better had the operation been performed earlier.

Dr. Herman Schwarz said that it was a recognized fact that after operations for pyloric stenosis some of the patients died one, two or three days after and apparently from too great a quantity of food being given.

Dr. J. Finley Bell, of Englewood, said that in his observation of several such cases, he believed that operation should be decided upon as soon as it was noted that no fecal matter appeared in the stools. This was an indication of complete stenosis and was a positive indication for operative interference.

A CASE OF AMAUROTIC FAMILY IDIOCY.

Dr. Charles Gilmore Kerley presented a child, eighteen months old, a Hebrew, a ward of the New York Infant Asylum.

The early history was somewhat vague. The child had been under observation since he was one month of age. Had been boarded out and visited by a nurse once a month. He had never been bright, had never smiled, had never appeared to care for, or take hold of, toys, and had evinced no interest in his surroundings. Because of this he had with difficulty been kept in any home, because the people thought the child was sick, or at least was an unnatural child. The body was plump, fat, and the child was regarded as doing reasonably well until September 28th. The child was stupid, inactive, and the woman who kept the home asked that he be sent into the institution; this was done immediately. The child was dull and heavy looking. The pulse was very slow, 55 to 60, besides being irregular. The reflexes were all absent. The pupils reacted slowly. The fontanel, which was small, was tense and bulging. A lumbar puncture was performed, and 2½ ounces of fluid withdrawn under a great deal of pressure. After withdrawal of the fluid, the heart action improved and ranged from 110 to 120. The child brightened a little, but the mental dullness and apathy continued. The cerebrospinal fluid was examined by Dr. Hemenway, but nothing abnormal was found. Dr. Reese examined the child's eyes and a diagnosis of amaurotic family idiocy was made.

Dr. Robert Grigg Reese said he had examined the eyes of the infant Dr. Kerley had just presented and found the lesions characteristic of amaurotic family idiocy, consisting of a white spot at the macula lutea, twice the size of the optic papilla with a brownish-red almost circular spot at its centre. Hyperacousis was very marked. The ophthalmoscopic picture was due to a degenerative change in ganglion-cell layer of the retina.

Dr. George Dow Scott reported the case of a child twelve or fourteen months of age, passed by three physicians as amaurotic family idiocy. The posterior nares of the child was found fully plugged with adenoids. The removal of the adenoids was followed by a complete recovery from the pseudo-imbecility.

Dr. Godfrey R. Pisek said he had seen 3 such cases within the last seven years, and had a good opportunity to see and study the eye grounds. One patient had a pseudo-paralysis which was very marked. All these cases died before attaining the third year. He was particularly interested in the presentation of Dr. Kerley's case with the increased pressure of cerebrospinal fluid.

Why such an increase in pressure should exist demanded some explanation. In the future he intended to examine the cerebrospinal fluid in these cases to see if he could get closer to the etiology of the condition.

A CASE OF SCORBUTUS.

Dr. Godfrey R. Pisek presented a child thirteen months old. This case was not presented because it was an unusual case, but because in the last 3 cases he had seen, each one had been treated for some surgical affection. He did not believe, however, that these mistakes are generally made by internists or pediatrists. The surgeons apparently often noticed and treated the local condition only, and in their hurry or unsystematic examinations failed to make a diagnosis.

The baby he presented nursed for six weeks. The breast milk then became insufficient and the child was placed on condensed milk for two weeks. Following that the baby was given Borden's malted milk and had been taking it until it came under observation.

The mother told the following story: "Six weeks ago in crawling about he sprained his knee and was taken to a dispensary where he was treated locally by a surgeon."

The feeding history in this case was very suggestive. Dr. Pisek had questioned along the line of scorbutic symptoms, and learned that, whenever the child's mouth was cleansed, it bled. Blood had appeared in the stools on a few occasions, but this was supposed to have been due to a gastroenteritis the child had had. The so-called "sprain" (?) of the right knee soon passed to the left knee, and then the baby was brought to the attention of the medical clinic.

The baby was seen for the first time seven days ago. He had a waxy, pale color. The limbs were in a condition of pseudoparalysis. The right knee was somewhat swollen and painful. Even pressure upon the chest or ribs caused pain. An examination of the mouth showed the characteristic condition of the gums, swollen and spongy; the hemorrhagic appearance of scorbutus. The swelling of the knee had diminished considerably, even after a few days of treatment. The child had no rickety manifestations. Syphilitic paralysis was readily ruled out. The history of the use of a proprietary food for so long a period was suggestive and the proof was in the result of the antiscorbutic treatment. It was interesting how well such babies could immediately take raw milk without any trouble; they could take care of it without any digestive disturbances whatever.

An examination of the blood in the case presented showed nothing of special interest. The hemoglobin was 30 per cent., the red cells numbered 2,500,000 and there were 7,400 white cells. The differential count showed: Polymorphonuclears, 35 per cent.; small lymphocytes, 20 per cent.; large lymphocytes, 39 per cent.; transitionals, 4 per cent. Eosinophilia was not present. In other words a well-marked secondary anemia.

An X-ray picture of the child was passed around, which showed the characteristic changes.

DR. DEXTER D. ASHLEY reported an interesting case of scorbutus which presented but a few symptoms of the disease. This child was brought to the institution on October 2d. Two doctors had failed to find anything the matter. The child cried when dressed. And another doctor, who was called in later, discovered that "one leg was broken." The child really had no scorbutic signs; no typical signs were referable to the teeth. The only sign was this tenderness of the left limb. Antiscorbutic treatment cured this patient.

DR. ELI LONG reported 1 case of scorbutus in which there was tenderness of one hip only, and some time elapsed before a diagnosis could be made. Any of these little children who are fed with "saw-dust" foods who complain of a sore limb should be carefully examined for scorbutus.

A CASE OF SEVERE INFANTILE PARALYSIS, SHOWING POSSIBILITIES OF APPARATUS CORRECTLY APPLIED.

DR. CHARLTON WALLACE presented a boy, twelve years old, whose onset of paralysis occurred when he was two and a half years old. He was treated for three and a half years by a private physician, and also in the various institutions and dispensaries of this city. During all this time the boy had not been able to walk; he could not get around at all except by crawling or with the aid of a chair. Up to last April he never stepped alone. Both lower extremities were paralyzed except one tensor vagina femoris. With the aid of a brace-maker, an apparatus was made which enabled the boy now to go with crutches as far as a block at a time. He now was in school, and was developing rapidly, physically and mentally. His back was being straightened, and he was given massage, passive motions, and vibrations. This case clearly demonstrated what could be done if one was persistent and applied their mechanical knowledge, doing all they could to support the paralyzed muscles.

A CASE ILLUSTRATING THE PROPER TREATMENT OF WEAK FEET.

Dr. Charlton Wallace presented a girl with weak feet, who had been under treatment for one year. She had typical flat feet, but without any muscular spasm or rigidity. For two years she had more or less disability because of her feet, with pains in the calves of her legs, and she was unable to walk far. The treatment during the past year consisted only in the use of shoes which raised the inner border of the foot one-quarter of an inch, thus throwing the weight of the body to the outer border or strong part of the foot. The girl showed the typical condition of bulging of the scapho-navicular joint. She walked with her toes turned out, and she was being taught to walk with the toes straight ahead. Exercises were given to strengthen the muscles of the calves of the legs. Without treatment directed to the development of these muscles, no apparatus could ever effect a cure. Whitman's plate could be adjusted comfortably in 95 per cent. of these cases.

Dr. Eli Long asked Dr. Wallace what they should tell mothers who were teaching their children to walk.

Dr. Charlton Wallace replied that it was only necessary to tell the mothers to allow the child to go barefooted and no further teaching would be necessary. The weight of the body should fall on the outer side of the foot. He cautioned against placing heels on shoes too soon in a child's life.

A CASE OF DIABETES IN A CHILD SEVEN YEARS OF AGE.

Dr. David Bovaird presented a child who had been brought to the Presbyterian Hospital in August. He was seven years old. The family and previous histories were negative. Three weeks prior to admission the child had been noticed to urinate frequently and to be passing an unusual quantity of urine. He had an extreme degree of thirst and an insatiable appetite. The physical examination revealed nothing important except what one could see at a glance. The child was under weight and poorly nourished and slightly anemic. His organs appeared normal. He was passing between 3,500 and 5,500 c.c. of urine daily. The percentage of glucose varied from 1.5 to 2.9. After keeping the child under observation for several days to determine the conditions under the ordinary diet, he was placed in Dr. Cooke's hands for a study of his metabolism on various carbohydrate diets. It was extremely difficult to handle this patient. When he was placed on a strict diet and the sugar reduced he made the ward in which he was kept a bedlam. He would invade the kitchen whenever possible and help himself to sugar and anything else obtainable.

Dr. Robert A. Cooke presented charts which gave a summary of the work done in the case of diabetes presented by Dr. Bovaird, and pointed out the following points of interest:—

(1) The rapid disappearance of sugar on a carbohydrate-free diet.

(2) The very slight increase of acidiosis with the sudden change from regular to carbohydrate-free diet.

(3) The varying utility of the carbohydrate administered in different forms.

(4) The rapid elimination of carbohydrate when administered beyond the limit of tolerance.

A CASE OF DIABETES IN A CHILD SIXTEEN MONTHS OF AGE.

Dr. Charles Gilmore Kerley reported this case, which was of interest because of the tender age of the child. When fifteen months of age the child weighed 20 pounds. The patient had suffered from early malnutrition and had been fed on malt soup. The mother noticed when the baby was fifteen months and one week of age that she was very thirsty, and that she wanted to drink more water than she should. After noting this the mother brought the child to Dr. Kerley. He secured a specimen of urine and found that it contained 3 per cent. sugar, as well as acetone and diacetic acid. The child died in two months. During the illness the sugar varied from 2 to 3 per cent. There was nothing unusual in this case except the tender age of the child, this being the youngest case of the kind that Dr. Kerley had ever seen.

A CASE OF PERSISTENT INTUSSUSCEPTION DUE TO AN UNUSUAL CAUSE.

Dr. Charles Gilmore Kerley reported the case of a child which came under his care for constipation and distended abdomen when seven months old. There was obstinate constipation and extreme distention of the abdomen. The constipation was very persistent, and required the use of laxatives daily to move the bowels. Unless the bowels were moved frequently the distention would be extreme; when the bowels moved freely the distention would disappear. There was thus an intermittent distention of the bowels with constipation. He said he was impressed that there was present something more than the mere constipation, and a rectal examination was made and an intussusception was found, which could be forced up readily with the finger. A tube introduced could be passed into the intussuscepted portion and the gas allowed to escape. The opening felt like the uterine os. Various medical men were consulted and various opinions were expressed. The condition continued; the abdomen became more distended, and on one or two occasions quite a collapse was caused because of the pressure of the gas-distended intestine upon the diaphragm. An exploratory incision was consented to, in order to determine just what was wrong. Dr. Samuel S. Gant did the operation seven months ago, entirely relieving the child, and, the intussusception being cured and the gut in position, the child throve. The constipation remained something of a factor in the management, probably as a result of the extreme dilatation of the colon above the invagination. The abdominal distention disappeared with the reduction of the invagination.

Dr. Samuel S. Gant said that it was easy to verify the condition in this child with the proctoscope; the invaginated portion of the bowel was eroded or in a chafed condition. After examining the child he felt sure that there was both a chronic invagination and some other mechanical obstruction present.

These cases of chronic invagination, he thought, are more common than is generally believed.

Dr. Gant described the operation he performed. A large fibrous band was encountered which bound the hepatic flexure to the central part of the abdominal wall. This fibrous band was about one and one-quarter inches wide.

The band was divided and then the hepatic flexure of the colon and the sigmoid were anchored to the inner abdominal parieties to overcome the dropping downward of the gut and prevent a recurrence of the invagination after it had been withdrawn.

Dr. Gant stated that he had performed colopexy eighty-nine times for the relief of enteroptosis and chronic invagination in adults, and that the results had been almost universally satisfactory.

A CASE OF EDEMA OF THE GLOTTIS COMPLICATING NEPHRITIS, WITH SPECIMENS, IN A CHILD FIVE YEARS OF AGE.

Dr. Joseph C. Roper reported the case of a child who was admitted to the New York Hospital with a diagnosis of laryngitis and bronchitis in February, 1909. The child was five years of age. Up to a few days before admission she was apparently well. She remained in the hospital two weeks. She had very little temperature. The dyspnea was fairly marked and it was thought that she was suffering from a spasmodic laryngitis complicating a bronchitis. Culture from throat showed no Klebs-Loeffler bacilli. The condition gradually subsided under the regulation treatment of irrigation, applications to the throat and steaming. The child returned to the hospital October 4, 1909, with dyspnea very marked. She had been well until one week before, when she had developed a cold, and six days later was brought to the dispensary for treatment. On the day following she was brought to the hospital with very marked expiratory and inspiratory dyspnea. The child remained in the reception ward for twenty-four hours, and after a culture from the throat had proved negative was admitted to the children's ward to the service of Dr. L. A. Conner at 2 P.M. The dyspnea was so great that it was deemed best to intubate the child. This was done, with temporary relief. At 10 P.M. marked expiratory dyspnea appeared, following a feeding.

The heart gradually weakened, and, at 5 A.M. the next morning, without having developed any special cyanosis, the child suddenly died.

At autopsy there was a marked edema of the glottis; the heart showed considerable hypertrophy; the left ventricle was slightly dilated and the right auricle and ventricle were distended with blood. The left kidney was markedly atrophied, being represented by a small mass, about 2.5 x 1 cm. The other kidney was enlarged and showed marked parenchymatous changes.

The question naturally arises, Was this edema glottidis due solely to the renal insufficiency? A negative culture for diphtheria organisms was made on the occasion of the first attack in February. During the fatal attack a negative culture was made during life. One culture made immediately after death showed, amongst a great variety, a few organisms having the appearance and staining reactions of Klebs-Loeffler bacilli. An emulsion of this mixed culture was inoculated into a guinea pig. This animal died forty-eight hours later of septicemia due to the bacillus mucosus capsulatus. The site of inoculation showed no diphtheritic lesions. Smears and cultures made postmortem failed to reveal any Klebs-Loeffler bacilli. Sections of the larynx stained by Gram's method and with methylene blue showed only cocci and a few short bacilli. The larynx and vocal cord showed moderate inflammatory exudate but no membrane. The deeper layers of the larynx showed some round-celled infiltration.

Urinary Tuberculosis in Children.—Leedham Green, in *The British Journal of Children's Diseases,* says that instead of regarding it as a relatively rare disease, which, when present, is difficult to alleviate and hopelessly incurable, we now know that urinary tuberculosis is exceedingly common, and when recognized early and the primary focus removed is of distinctly good prognosis. Systematic examination of urine will reveal tubercle bacilli in many unsuspected cases. If in doubt, the opsonic index and the ocular and cutaneous reactions should be resorted to. The writer notes the weak points of these tests, and says that the only reaction giving a clue to location of infection is that of subcutaneous injection of old tuberculin. The author insists on the importance of cystoscopy for estimating involvement of the bladder, and says that it may be practised in the youngest girl and in boys over eight years. Chromocystoscopy—the injection of carmine blue subcutaneously, and observing its excretion through the cystoscope—is a valuable adjunct. Where numerous tubercle bacilli and transitory hematuria exist without indication of site of trouble, a good substitute for exploratory nephrotomy is to expose the ureter subperitoneally by a small incision in the abdominal semilunar line, open it by a small longitudinal cut, insert a fine urethral catheter, and collect the urine separately. A fine stitch closes the opening in the ureter, which is dropped back to place and the wound is drained for a day or two.—*Charlotte Medical Journal.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

Regular Meeting, October 12, 1909.

J. CLAXTON GITTINGS, M.D., PRESIDENT.

PICA IN A MENTAL DEFECTIVE.

DR. E. F. CORSON, by invitation, showed a girl of thirty-three months, who, at three months, had fallen, striking her head so severely that she was unconscious several minutes and remained stupid some days. At eighteen months she was apparently a normal, healthy child. Soon afterward it was noticed that she gnawed, chewed and swallowed matting, cloth, string, wood, pieces of the furniture, etc. When two years old she had a sudden attack of vomiting, became drowsy, and remained in a stuporous condition for several days. She has not talked well since then. Six months ago she had a series of convulsions and has never spoken since. Apparently she does not hear either. She tears to pieces anything her hands find, and swallows it all. A visit to her home showed marks made by the child as high as her mouth would reach—a sort of "high-water mark."

DR. D. J. MCCARTHY considered this a very rare condition as the result of a mental illness. Ordinarily a perverse appetite was functional; in this case it was evidently psychic.

THREE CASES OF CEREBRAL INFANTILE PALSY IN ONE FAMILY.

DR. C. A. FIFE showed two children and reported the third out of a family of five children. Great-grandparents and grandparents were healthy; the father was a Russian Jew, never ill, but of a nervous temperament; did not use alcohol or tobacco, and gave no venereal history. Physical examination negative. He had five brothers and sisters living and well; two others died in infancy, cause of death unknown. The mother was a hard-working English Jewess, with a negative history, except for the evidence of poor nutrition. She had five brothers and sisters, while five others died in infancy. The mother was seventeen and the father twenty-one when the first child was born; he was now eight years old and seemed healthy. The second child was normal at birth, but died at sixteen months, after two months of diarrhea, without meningitis or paralysis. Mother became excessively depressed after death of child, would not leave the house and lost 50 pounds in weight. While in this condition she became pregnant for the third time. She gave no history of disease or injury during pregnancy, but she continued to work hard. Child born at term, breech presentation, easy delivery, no complications. Child was very spastic, spasticity affecting neck, trunk and extremities, arms extended and pronated, fingers flexed, thighs and legs flexed, but no talipes. Mother says that child made no voluntary movements of the extremities or trunk. No signs of paralysis of the cranial nerves were recognized. Deep reflexes were reported to have been "present"; no clonus. Muscular development not strikingly abnormal, but mental development decidedly retarded. Died when about one year old. Mother became more despondent. One year later one of the children shown was born, after normal pregnancy, easy labor, head presentation, without complications. This child also showed general spasticity and loss of power in extremities, affecting most markedly the flexors and adductors; decided talipes varus. Child was now sixteen months old; muscles of neck were still somewhat spastic, and there was moderate kyphosis. There was increasing power in the arms and in the first two fingers of each hand. She could move her head and hold it up, but she did not sit alone. No paralysis of sphincters.

Dr. Krauss reported: "Paralysis of external recti muscles; failure of pupillary reflex to light, accommodation undisturbed, slight blurring of edges of disc in each eye; vessels normal in size." No other symptoms of cranial nerve involvement, except a somewhat hoarse cry. Deep reflexes slightly exaggerated. Oppendeimer's eating reflex not present. Babinski's reflex present; no ankle clonus; skin reflex normal; electric reactions normal; no sensory disturbance; no choreic or athetoid movements; no atrophy or hypertrophy of individual muscles observed; no convulsions; possibly some mental deficiency, but child is not idiotic. Physical development retarded; weight, 14 pounds; length, 70 cm.; greatest circumference of head, chest and abdomen are, respectively, 44, 43, and 44 cm. Anterior fontanel almost closed. Tuberculin test negative; urine negative; blood count negative.

The other baby was six weeks old. She was like her sister, only the spasticity and lack of power are greater and there was no talipes. The child did not cry. In the three children the diagnosis made was cerebral infantile palsy of the diplegic type. While the etiology was obscure the cause must have been of prenatal origin. Everything was negative except the malnutrition of the mother, possibly due to emotional causes. The fact must not be disregarded that two normal children were born before the mother became despondent, and all children born during the period of depression were paralyzed.

Dr. McCarthy considered these cases of Little's disease. At autopsy in such cases a very small pyramidal tract was found. This was probably due to multiple extravasating hemorrhages into the cortex, cerebellum and spinal cord at birth. Evidence was all against a primary sclerosis. Experimentally, in lower animals, a perversion of function of the motor cells occurred as a result of free blood in the tissues, resulting in destruction of the ganglion cells, finally in calcification. Before birth localized hemorrhage led to an infiltration of the ganglion cells, degeneration and failure of development of the pyramidal tract. To show this, Dr. McCarthy exhibited several specimens of newborn puppies. The talipes found in these cases was unquestionably the result of prenatal poliomyelitis.

Dr. A. A. Eshner said that a single case of this kind was interesting enough, but the occurrence of several similar cases in the same family was unusually interesting. In many such cases there was a history of prolonged or difficult labor, and it then seemed not difficult to attribute the condition to hemorrhage or traumatism, but in the absence of such an etiologic factor, one must think of some underlying condition in the mother as predisposing to a disorder occurring in several children. Dr. Eshner referred to a girl whom he had seen only the day before, presenting jerky, incoördinate movements of the head, whose brother had been under his observation several years previously with symptoms of cerebral spastic paralysis. Another brother in this family was said to have symptoms suggesting a similar affection.

Dr. D. J. M. Miller said that infants will often exhibit symptoms of cerebral paralysis when autopsy reveals nothing macroscopically; but a microscopic examination would show diffuse meningoencephalitis, as was found in a case under his care. This child, born by the breech, shortly after birth manifested great rigidity of limbs and retraction of head. This condition persisted; the least excitement would call forth a spastic condition; at eight months it could not hold up the head. It then acquired whooping-cough, during the paroxysms of which there would be extreme opisthotonos, which finally became almost permanent, till death occurred.

DR. FIFE repeated that there was no disease or infection in the mother which could explain the occurrence of these cases; nor was labor difficult or precipitate. The first two children were normal, born before any nervous disturbance had been noted in the mother.

DR. MCCARTHY said that the type of mother, in these cases, had not been investigated by him. The transmission of bacteria or bacterial toxins may be possible. The question of the transmission of altered blood tension from the maternal to the placental circulation should be considered. Dr. McCarthy had made some investigations along this line, but the results at present were such that satisfactory conclusions could not be drawn.

LEUKEMIA.

DR. J. CLAXTON GITTINGS was to have shown the boy exhibited last at the May meeting. He was readmitted to the University Hospital, with a history of uncontrollable bleeding following the extraction of a tooth. Examination showed a slightly enlarged spleen (1 cm. below ribs), but no enlargement of the liver or palpable glands. At the left apex there were signs of beginning infiltration and the Moro reaction was faintly positive. A week later Vincent's spirillum was found in smears from the edge of the gums, followed by cervical adenitis, with cellulitis and abscess of the upper lip finally. This was accompanied by prostration and dyspnea. The spleen reached 3 cm. below the ribs. Before death, four weeks after readmission, there was coffee-ground vomiting with bleeding from the bowel. No autopsy was obtained. Blood examination showed a range in hemoglobin from 59 to 14 per cent.; erythrocytes, 2,000,000 to 1,020,000; leukocytes, 6,200 to 55,500; myelocytes, from 63 to 68 per cent. The case will be reported later in detail.

DR. HOWARD T. KARSNER read a paper on

SPLENOMEDULLARY LEUKEMIA IN CHILDHOOD.

Leukemia was not described in children until sixteen years after the original papers of Virchow and Hughes-Bennett. Even then the distinction between the two forms was not recognized and only in recent years has the difference been well brought out. Only 8 cases of the splenomedullary type were found in literature, which cases were given in full. Dr. Karsner then reported a case on which he had performed the autopsy. Beside the leukemia, there was decided rachitis, with the appearance of large numbers of giant cells in the bone marrow. The conclusions drawn were as follows: That splenomedullary leukemia in childhood was a rare condition; that it became more common or less rare as adult life approached; that it occurred much more commonly in males than in females; that blood examination showed larger total counts of the leukocytes and that the differential counts showed larger percentages of lymphocytes than were found in the adult form of the same disease; further that the transitional forms of leukemia were relatively frequent in the early period of life; that the course of the disease is usually rapid and the outcome fatal; and that the leukemias of childhood as well as those of adult life presented very definite pathologic features, both grossly and histologically, by which competent examination can determine the diagnosis with accuracy.

Dr. W. T. Longcope said that it was probable that in the cases of socalled mixed leukemia the large mononuclear cells or large lymphocytes were in reality early, nongranulated myelocytes or promyelocytes. It had been definitely established through the work of Opie, Jochmann, Müller and others that the polymorphonuclear leukocytes and neutrophilic granular myelocytes contained a ferment which was capable of digesting proteids. Biologically therefore these cells had a property which differentiated them sharply from the small lymphocytes which contained no proteolytic ferment. In studying a case of socalled acute lymphatic leukemia Dr. Donhauser and Dr. Longcope found that the large lymphocytes contained a proteolytic ferment exactly like that in the granular myelocytes and polymorphonuclear leukocytes and therefore these cells must be considered biologically as myelocytes.

CONGENITAL IMPERFORATE RECTUM.

Dr. J. H. Jopson reported 2 cases of operation for imperforate rectum. The first patient was a boy two and a half days old, in whom the anus and lower portion of the rectum were well formed but from whom no bowel movement had been obtained. The abdomen was distended, and vomiting occurred repeatedly. Left iliac colostomy was performed and the entire sigmoid and colon were found to be imperforate. The lower part of the small intestine was sutured in the wound, opened at once, and inspissated meconium washed out. There was some fecal discharge following operation, but death occurred eight hours afterward. The condition was evidently incompatible with life.

In the second case, a boy twenty-four hours old, there was imperforation of both anus and rectum. A perineal incision under chloroform anesthesia failed to reach the bowel at the depth of two inches; colostomy was performed at once and the distended sigmoid opened. The child recovered from the operation and was alive two weeks later, but death occurred subsequently from lack of proper food, as the parents were poor and ignorant and the proper artificial food was not obtained.

Dr. Jopson has operated on 5 cases of imperforate anus and rectum, with a mortality of 40 per cent. There was another death, occurring in a case in which the rectum communicated with the bladder and could not be reached by perineal operation. This child also succumbed after colostomy. Two of these cases were alive and well. In one the rectal pouch was very close to the perineum and operation was simple; in the other it was reached at a depth of an inch and a half from the perineum. Dr. Jopson recommended operation at the earliest possible moment, and if the bowel could not be reached within two inches of the perineum, immediate colostomy is indicated.

PELVIC ABSCESS DUE TO RUPTURED EMPYEMA.

Dr. R. B. Walker, by invitation, reported this case.

Dr. Jopson said that this case was a very unusual and interesting one. While infection frequently travelled upward through the diaphragm, forming subphrenic abscess, for example, it rarely travelled downward. Many cases of empyema were seen in which the collection of pus found spontaneous exit through a bronchus or by pointing on the chest wall in the neighborhood of the nipple; but very seldom would it take a downward direction, as in this case.

CURRENT LITERATURE.

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ABSTRACTS IN THIS NUMBER BY
DR. T. WOOD CLARKE. DR. C. D. MARTINETTI.
DR. HENRY HEIMAN. DR. M. C. PEASE, JR.
DR. G. R. PISEK.

PATHOLOGY.

BAISCH, K.: THE INHERITANCE OF SYPHILIS BASED UPON SEROLOGICAL AND BACTERIOLOGICAL STUDY. (*Muench. Med. Woch.*, 1909, No. 38, p. 1,929.)

As the result of extensive examinations of mother, placenta and fetus in 140 cases for spirochetæ and the Wassermann reaction, it may be said that in 80 per cent. of all cases of premature death and maceration syphilis is the cause. The habitual abortions of the first four months are not due to syphilis. Seventy-five per cent. of mothers of specific children show no chemical symptoms of syphilis. When, however, such mothers give positive Wassermann tests they are infected in spite of apparent health. Such mothers who give negative reaction are, in all probability, infected. In such case it is a question of an inhibition of the reaction. Colles' law and Profeta's law depend on the fact that the mother or the child is refractory to syphilis, because it is already infected. Colles' law has no exceptions. The best hope for therapeutic results and for obtaining a healthy child from syphilitic parents depends on an energetic and systematic course of specific treatment before and during pregnancy.

T. WOOD CLARKE.

SURGERY.

DEL LAGO, E.: INTESTINAL OCCLUSION CAUSED BY ASCARIDES. (*Rivista Medica,* 1908, p. 61.)

A boy seven years old was seized with sharp pains in the epigastrium and umbilical region. Vomiting and obstipation. No temperature nor headache. At the hepatic angle of the colon there was found to be a tumor painful to the touch. Suspecting the presence of parasites a dose of anthelmintics was given. Promptly twenty-five ascarides appeared, followed by twenty more. The expulsion continued for ten days, reaching a total of 450. Some appeared by way of the mouth. The child recovered completely.

C. D. MARTINETTI.

COMBY, J.: CHRONIC APPENDICITIS IN CHILDREN. (*Archiv. für Kinderhk.*, Vol. I., p. 133.)

The clinical picture of the disease is not clearly marked. Most of the children suffer from flatulent dyspepsia and constipation. Some have recurrent attacks of socalled food fever, associated with coated tongue, anorexia, urticaria, icterus, oliguria and constipation. Cyclic vomiting is frequently a symptom of chronic appendicitis, as shown by a careful study by the author of 100 cases of this condition. Abdominal pain is frequently complained of, localized in the umbilical or epigastric regions. The physical examination of these children is very important, as it enables the physician to make the diagnosis. It reveals tenderness over McBurney's point, slight muscular rigidity, and occasionally a thickened appendix or enlarged mesenteric glands.

Chronic appendicitis is to be differentiated from mucomembranous enterocolitis and dysentery. Occasionally a coxalgia may give similar symptoms, but the latter can be excluded by the absence of muscular spasm and normal motions about the hip joint. HENRY HEIMAN.

VON BRAMANN: THE TREATMENT OF HYDROCEPHALUS BY PUNCTURE OF THE CORPUS CALLOSUM. (*Deutsch. Med. Woch.*, 1909, No. 38, p. 1,645.)

The previous operations to relieve hydrocephalus have been followed by decidedly unfavorable results. A new procedure is recommended which has been developed at the suggestion of Acton, of Halle. This consists of making a permanent channel through the corpus callosum. The technique is as follows: The skull cap is opened by trephining, the centre of the opening being 1 cm. to the side of the mid line and just behind the coronal suture. The dura is opened wide. With a curved tenaculum the hemispheres are separated, care being taken to avoid the veins. A curved trochar of 2-3 mm. in diameter is passed down between the cortex and the dura to the falx and the corpus callosum punctured. After the intraventricular fluid has stopped flowing, the trochar is moved back and forth in an anterior-posterior direction to enlarge the opening. The trochar is then removed, the dura stitched up and the wound closed tightly. In young infants the opening is made through the anterior fontanel. Eight cases have been so treated. Several survived and showed some months later decided improvement, such as increase of power, improved coördination, reduction of the degree of the optic neuritis, and distinct advance in mentality. T. Wood Clarke.

MEDICINE.

Lichty, J. A., and Donaldson, H. H.: Report of 2 Cases of Henoch's Purpura with Symptoms Like Acute Appendicitis. (*The Archives of Diagnosis,* July, 1909, p. 289.)

These 2 cases presented many interesting points of diagnosis, and in less careful hands might very well have been subjected to a useless operation for appendicitis. Henoch's purpura is distinguished from other forms by a series of abdominal symptoms superadded to the purpuric eruption and joint pains. As a result of observing these cases the authors suggest that a definite effort to obtain a history of previous rheumatic attacks and a careful examination of the entire body for any eruption and joint pain be made in every case of suspected appendicitis. In those cases where the diagnosis is in doubt the stools, the urine, and any vomitus should be examined for occult blood. Lichty and Donaldson conclude that probably Henoch's purpura need only be kept in mind whenever a suspected case of appendicitis is seen in order to avoid making a wrong diagnosis.

M. C. Pease, Jr.

Muggia, Alberto: Purpura in Infants. (*La Pediatria,* September, 1909.)

The pathology of purpura in infants is obscure, the disease manifesting itself in a multitude of different ways. The treatment consequently must also be varied. Early in the attack injections of antidiphtheritic serum may be of service. The reaction they cause is pronounced but usually well tolerated. Improvement and recovery follow rapidly. Fibrin is increased in the blood, producing an arrest of hemorrhages. This method appears to Muggia to be far superior to treatment with adrenalin or hemostatics. C. D. Martinetti.

Omodei-Zovini, C.: Infantile Malaria. (*Bullett. Stazione Antimalarica di Capria,* March, 1908.)

In some sections of Italy children are frequently found to have fever with alarming symptoms which are due solely to malarial infection. Children are very easily infected. At least half of the total cases in some regions consist of children under twelve years of age. The author had occasion to study 10 cases between three and six years with pronounced derangements of digestion, respiration and nervous system, besides temperature. He demonstrated in every case the presence of the parasite and every one was cured with quinin tannate in chocolate tablets. Very often indeed similar forms of malaria are diagnosed as various other ailments. Zovini has treated recently 150 children who have been completely freed from infection.

C. D. MARTINETTI.

KROLIKOWSKI, DR. W.: SIX SPECIMENS OF TAENIA SAGINATA IN A CHILD OF NINE YEARS. (*Przeglad Pedyatryczny,* Vol. I., Fasc. 3, 1908-09, p. 219.)

Dr. W. Krolikowski (Warsaw) reports a rare case of taenia saginata in a boy of nine years. The boy was anemic, complained of headache, abdominal pain and weakness. The proglottides of the tape worm were found in the feces. After the treatment (Extr. filic. maris aeth.; pulv. r. fil. maris aa 4, 0; m. and rhubarb.) six parasites were passed. Their weight was one-half pound, their length twenty feet. The author found in the literature only one similar case, namely that of Dirkson. (D. M. W., 1903.)

G. R. PISEK.

STAMM, C.: NOCTURNAL HEAD MOVEMENTS. (*Archiv. für Kinderhk.,* Vol. I., p. 168.)

These movements resemble those of spasmus nutans, but are usually more marked and extensive. They occur in older children, have no relation to rickets, and are not associated with nystagmus or other ocular symptoms. The mental development is not retarded. The duration is very variable. Treatment is very unsatisfactory. Cold packs and bath are not of great benefit; and sedatives such as bromids and hyoscin are ineffectual.

HENRY HEIMAN.

HYGIENE.

CLUTTERBUCK, HERBERT E.: DIPHTHERIA CARRIERS; WITH SUGGESTIONS FOR CONTROL. (*The Canada Lancet,* August, 1909, p. 926.)

The Klebs-Loeffler bacillus, the cause of diphtheria, occurs in different morphologic forms, some more virulent than others.

The virulent type is most frequently found in the throat, while the less virulent forms are more frequently found in the nose. All forms of the organism may be found in the nose and throat of well people, or of people only slightly ill. It would be better, therefore, if we disregarded entirely the old clinical classification of sore throat and recognized only the bacteriologic method of diagnosis.

The transmission of the contagion is by contact. The infection does not generally travel far beyond the immediate neighborhood of the sick person. At the end of three weeks a large proportion of the bacilli thrown out during an average case of diphtheria will either be dead or very much attenuated, and will be found chiefly on those articles which have been in direct contact with the patient's mouth. Diphtheria is not an air-borne disease.

The following deductions may be made:

(1) Our greatest weapon is the Board of Health laboratory. All means calculated to extend its usefulness should be eagerly sought.

(2) Among school children the physician should regard every case of sore throat as a case of diphtheria until he has, by the means at his disposal, proved it to be otherwise.

(3) When a case is found to be diphtheria it should be thoroughly and rigorously isolated. M. C. PEASE, JR.

INFANT FEEDING.

MALAGODI, ARMANDO: HAVE INGESTED FATS AN EFFECT ON BREAST MILK? (*Riv. di Clinica Ped.*, October, 1909.)

In a long and accurate study of the effects of ingested fats on the composition of breast milk, Malagodi reaches the following conclusions: An increase of fats in food does not appear to affect the milk. A decrease causes a decrease of fats in the milk. Whilst a change in the quantity of milk-fats often takes place, the quality changes oftener still, the milk assuming a totally different character macroscopically. This would account for many disorders of digestion in breast-fed infants.

The author is inclined to admit an elaboration of the milk components in the mammary gland itself.

C. D. MARTINETTI.

BOOK REVIEWS.

Children in Health and Disease. A Study of Child Life. By David Forsyth, M.D., Sc., Physician to the Evelina Hospital for Sick Children; Assistant Physician and Joint Pathologist, Charing Cross Hospital. Pp. 362. Philadelphia: P. Blakiston's Sons & Co., 1909.

We are so accustomed to regard the child from the standpoint of his diseases, and our text books are in the great majority written from that point of view, that it is refreshing to come upon a book which attacks the subject from a slightly different position. Dr. Forsyth's book presents the normal child and shows how he reacts to his environment and to the untoward influences of his daily life; and points out what these are and how they act. Beginning with the physiology of the child from birth to puberty, he then treats of his psychologic development, his life in school, and the medical aspects of that part of his life. There are chapters on the medical inspection of schools, on the general training of children, on infant mortality, on conditions of infant life, on the diagnosis of disease in children, and on some points in the treatment of children. Many well-known facts are here properly correlated and one finds much material which is quite new and helpful. Especially to be noted is that the author is well aware of the deleterious effect of too much time spent in school and of the effect of fatigue upon the growing child. The book is very interesting reading.

Practical Points in the Use of X-ray and High Frequency Currents. By Aspinwall Judd, M.D., Formerly Radiologist Post-Graduate Medical School and Hospital; Adjutant Professor of Surgery Post-Graduate Medical School and Hospital, etc. Pp. 185. New York: Rebman Co., 1909.

This is a small but very simple and complete manual for the use of X-Ray and high frequency currents and the apparatus for generating them. The descriptions are clear and not ultra scientific. Brief résumés of the methods and the results of treatment in many disease conditions are given, and there is an appendix on radiography.

ARCHIVES OF PEDIATRICS

DECEMBER, 1909.

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ORIGINAL COMMUNICATIONS.

ETIOLOGY OF SCARLET FEVER.*

BY ALFRED HAND, JR., M.D.,
Philadelphia.

In opening the discussion on scarlet fever, a brief reference to its history may not be without interest. Aretaeus Cappadox, born in 58 A.D., described an angina with a pustular eruption and some students of history see in this a likeness to scarlet fever. But the first clear description of what we know as scarlatina was written by Henry Smetius, the professor of medicine in Heidelberg, in 1600. His book, published nearly three hundred years ago (1611) has the following report of a case which he saw in 1581: “Winander Zonsius had an eruption of red macules over the entire skin, with chill, nausea and fever, these spots spreading over the thorax, abdomen, arms, legs and even in the face and scalp in a continuous redness, and united in the form of erysipelas; with which he perceived everywhere through the skin points as if made with needles, and at length there followed thin scales." (Quoted by Haken in his Goettingen Thesis, 1781.)

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* Read before the Philadelphia Pediatric Society, November 9, 1909.

The disease was undoubtedly widespread over Europe in the sixteenth century, for Ingrassias (died 1580), of Naples, saw a disease which he called rossalia, or rossania (the red disease), and Forest (died 1597), of Leyden, described a roodhont, probably borrowed from Lange's term, Der Rothe Hund (the red dog); but all of these observers included several different conditions in their descriptions. It finally fell to the great English clinician, Thomas Sydenham (1624-1689) to differentiate it clearly from measles and small-pox and to suggest the name *febris scarlatina,* which became universally accepted. I regret that we use the term scarlet fever more nowadays than scarlatina, which has the merit of being adapted for all languages, of being short, and of including those cases which have no fever; its general use would also rescue it from the meaning which the laity attach to it, of being applicable only to mild cases, which they think are less contagious than those that are called scarlet fever.

Scarlatina is said to have appeared in America about 1735.

Etiology.—Kirchner, in his Halle Thesis, wrote nearly seventy years ago that it was most remarkable that so distinct and widespread a disease as scarlatina, having such a high mortality, should still be of uncertain etiology. It is much to be regretted that that statement is still applicable. Several organisms have been described by different observers, notably a streptococcus by Klein, a diplococcus by Class, another streptococcus by Baginsky and Sommerfeld, neither of which has been accepted by the general consensus of opinion as proven, and more recently a protozoa-like body found in the skin by Mallory, and in blood serum by Duval. The arguments in favor of looking on a special strain of streptococci as being the specific cause may be summed up as follows:—

(1) They are always present in many of the organs in fatal cases and usually in all the throats of the anginose type.

(2) Other streptococcic septicemias and erysipelas are associated with a tendency to erythemas.

(3) Many epidemics seem to be spread by the milk supply, a famous one being that in London from the Hendon dairy, Klein

finding a special streptococcus in a pustular disease of the cows and a similar germ in the patients affected. In this connection it may be interesting to digress for a moment to read a section from the latest London letter in the *Journal of the American Medical Association* (November 6, 1909) on the "Relation of Scarlet Fever to Disease of Cows' Udder": "An epidemic of 400 cases occurred last summer in London and Surrey among the consumers of milk from a certain dairy, and as infection of the milk from a case of scarlet fever in a human being 'was excluded' [I would like to insert here the word "probably," for, no matter how carefully and thoroughly such an investigation could be conducted, it would still be possible for infection from human sources to enter undiscovered.] evidence pointed to infection from some condition of the cows. Sir William Power's theory, based on the Hendon epidemic, that since there was a relation between scarlatina and accidents of the puerperium, there might also be a connection between the disease and some condition in cows which had recently calved, seemed to be borne out in the recent epidemic. Three cows recently calved had been added to the dairy at the time when the milk began to show infectious properties, and they were found to have an eruption suggestive of the 'Hendon disease' on the teats and udders."

In reply to the arguments about the streptococci, it is said:—

(1) Their presence in all the organs, as in fatal cases of diphtheria, small-pox, etc., is due to a secondary infection.

(2) The argument that streptococcic septicemias often produce erythemas is of very little weight and need not be considered further.

(3) In reply to Klein's investigation of the Hendon epidemic, it was said at the time that the disease of the cows was cow-pox and that other dairies with cows similarly affected did not spread scarlatina among the consumers of their milk.

(4) Finally, it has been impossible as yet to reproduce symptoms of scarlatina in any of the lower animals with streptococci isolated from scarlatinal patients.

We are not yet in a position to say that the specific cause of scarlatina has been isolated, but such a discovery is one of the most important needs of the day. There are many points connected with the etiology which are clear, but there are many observed facts which cannot be accurately judged and their proper value assigned until the exciting cause is found. Our knowledge is in much the same position that it formerly was with regard to malaria, many facts observed about this disease (*e.g.*, lessened predisposition of dwellers in the upper stories; danger of being out of doors at certain hours; the ability of a steady wind off shore to carry the "miasm" to a ship at anchor) being explained only when the relation of the mosquito to the disease was known. And so it may be with scarlet fever when the exciting cause and its modes of travel are found out.

Although a few writers uphold the possibility of scarlatina being a group of several different diseases, this idea is not received with favor, and we are justified in asserting that it is a specific infection which is contagious, meaning that it is spread from the sick to the susceptible by direct contact or by fomites. It does not rank with measles in the degree of its contagiousness, of which every institution for children can give abundant illustrations. Thus, McCollum mentions an epidemic of 25 cases in an institution containing 150 children. The first epidemic of measles which I saw at the Children's Hospital affected 90 per cent. of the children unprotected by previous attacks, in spite of prompt isolation as soon as the rash appeared.

But even if scarlatina is not a highly contagious disease, a patient infected with it remains capable of spreading it for a much longer period than one with measles, and the specific virus cast off on to inanimate objects is highly tenacious of life. And yet we must not be too credulous in accepting reports of the germs latent in clothing, books, toys, etc., for generations, for we must be logical here as elsewhere and admit the possibility of other avenues of infection.

The low contagiousness is especially seen in families, for it falls to the lot of every practitioner to see one or two cases in a large family of children, while the other children remain exempt, although the quarantine may not be very strict. In explanation of this, someone has advanced the theory that the poison is so modified by the cells and chemistry of the patient's body that when it is carried into another body having similar chemical processes, it is unable to set up its characteristic changes. This is pure theory insusceptible of proof so long as we do not know what the exciting cause is. Another possible explanation is that through living in an infected atmosphere and receiving repeated small doses of infection the other members of the family acquire an immunity without giving visible reaction.

A. V. Meigs, some years ago, in calling attention to the low degree of contagiousness at the onset, urged that while strict precautions should be taken with regard to the patient, the other children should not be sent away from home unless they could be kept away for at least six weeks or two months, as a shorter absence seemed to make them more susceptible to the disease on their return than if they had remained at home all the time. This would seem to bear out the latter of the two theories, as would also the occurrence in hospital work of "return cases." Eighty per cent. of the scarlet fever cases in Philadelphia are treated in the Municipal Hospital. A definite percentage of these patients seem to carry the disease home to their brothers and sisters. I say "seem," because here again we must be logical and admit the possibility of other sources of infection. And Dr. Woody has related to me that sometimes when he has been ready to discharge a patient another member of the family would be admitted with a well-developed attack; if the first patient had been sent

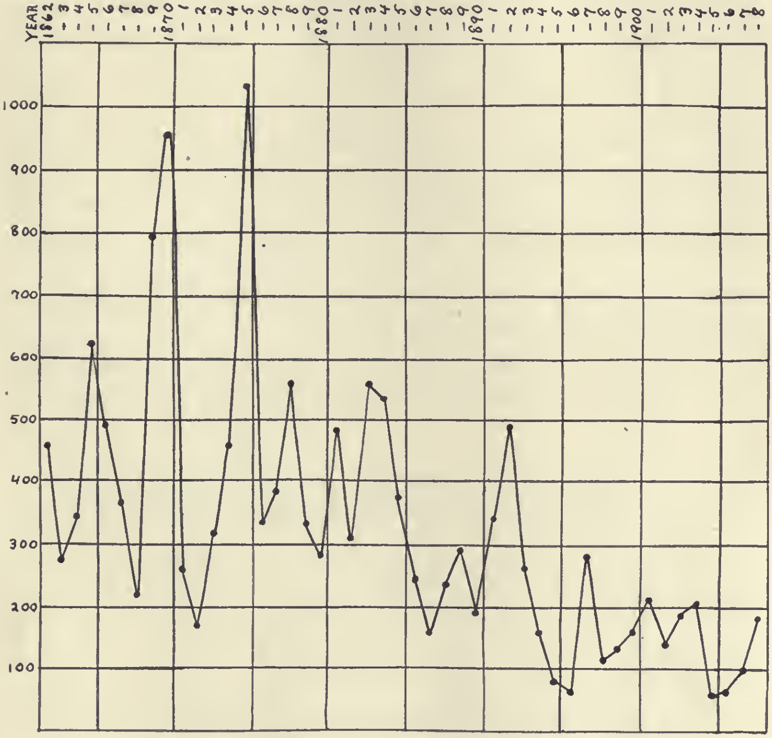

CHART I.—Total number of deaths from scarlatina in Philadelphia, 1862–1908.

home a day or two earlier the second one would have been classed as a "return" case.

The disease is one which varies greatly in different epidemics, both in morbidity and mortality, as shown by the accompanying Charts I. and II. For some years we have had a comparatively mild type of the disease, and yet the mortality still fluctuates irregularly from year to year.

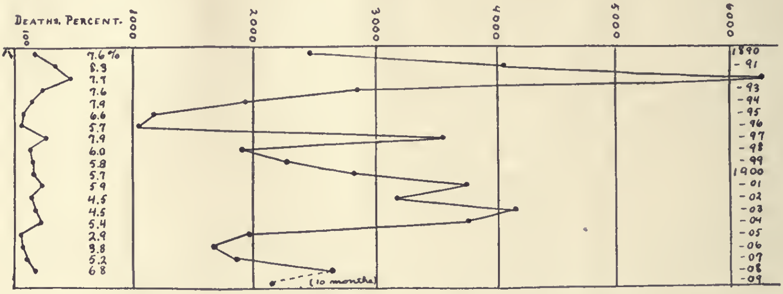

CHART II.—Total number of cases of scarlatina in Philadelphia, 1890–1908, with death-rate.

It is essentially a disease of the school term, as Chart III. il-

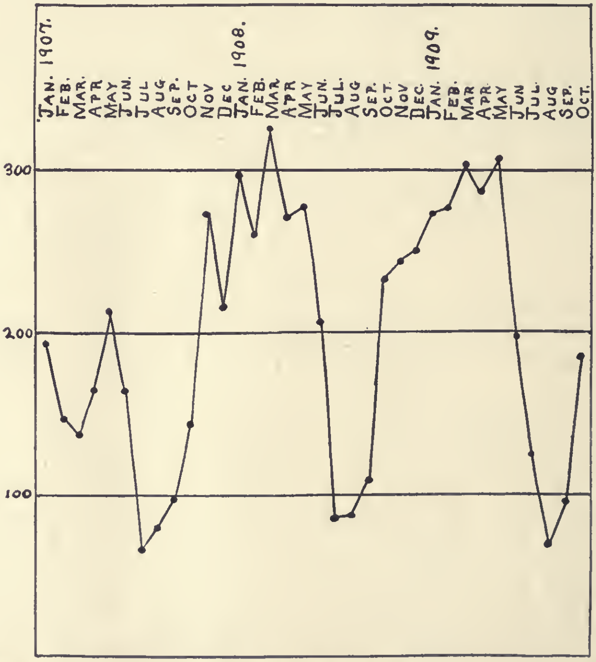

CHART III.—Monthly incidence of cases of scarlatina in Philadelphia, 1907–1909.

lustrates. As a striking explanation of why this is so, a letter was shown to me while consulting the records of the Bureau of Health, which had been received that morning from one of the assistant medical inspectors; he had excluded from a public school, on November 5th, a child who was desquamating universally. A visit to the child's home brought out the history that the child had had a sore throat on October 20th, and was under a physician's care until October 22d; that she returned to school on the 26th and had been in attendance for nine school days.

Scarlatina is also a disease of the temperate zone and especially of the Caucasian race. It is more prevalent in the Northern than in the Southern States of this country, and yet portions of the Eastern Hemisphere, with climate similar to that of the Southern States, do not show the same exemption. The natives of Japan and India are strikingly exempt, so that when the disease is imported it soon dies out after exhausting susceptible soil among the Caucasians.

It is not necessarily a disease of the more unhygienic and poorer quarters of cities, rich and poor being alike susceptible, but the mortality is greater among the poor because of the surroundings and the lack of careful nursing, which favor the development of streptococcic complications.

In the spreading of the disease a most important part is played by the mild cases, which are either unseen by a physician or are diagnosed as "scarlet rash" and no quarantine is imposed. It is in such cases that we are in great need of a method for the isolation of the specific organism. When we have that, we shall then know whether scarlatina can exist without a rash and with only a sore throat. It is my belief that such a thing is possible (although at present it cannot be recognized), for I once saw an epidemic of tonsillitis in four members of a family, the last one to become ill being the only one to develop a rash, which was distinctly that of scarlatina.

Having already overstepped the time limits, reference to the other points in the etiology must be omitted, and the main discussion of the symptoms must be left to Dr. Schamberg on the diagnosis and Dr. Woody on the complications. A punctiform erythema on a patient, associated with sore throat, nausea or vomiting, a pulse more rapid than would be accounted for by the temperature, which may be only slightly elevated, ought to make us treat the case as scarlatina. If, in addition, we can detect prominence of the papillæ of the tongue in the early days (strawberry tongue), which becomes more marked after the coating is shed (raspberry tongue), and if there is a desquamation after a week or two, then the diagnosis is confirmed, but their absence does not, in my opinion, necessitate a change in the diagnosis. For, in private practice, a child who has a daily bath and oil inunction rarely desquamates, except around the nails of the fingers and toes.

TYPHOID FEVER IN CHILDREN.—Marfan (*Jour. de Med. et de Chir.*, February 27, 1909) describes typhoid fever as it occurs in children. It is more infrequent in children than in adults, and is rarely seen before the fifth year. The youngest patient attacked by typhoid seen by the author was nine months old. The general methods of infection in infants are by milk diluted with impure water, the use of unsterilized milk, and the washing of milk containers in bad water. A wet nurse may give the fever to her nursling. At birth a child may bring with it into the world the germ which has attacked the mother during pregnancy. The onset of the disease is more sudden than in the adult and it reaches its acme sooner. From the second day the temperature is very high. Diarrhea is absent, and constipation the rule. There is an exaggerated hypothermia and very few digestive troubles, anorexia and the typical tongue being absent. The stools are infrequent and of an ochre color. Meteorism and abdominal pain are generally absent. Hemorrhages and perforation of ulcers are very exceptional. The Peyer's patches are not much swollen or deeply ulcerated. There is rather a septicemia than a true typhoid condition. Rose-spots are not always present, one-third of the cases never showing them. Sometimes they appear earlier and are more abundant than in the adult. Relapses are more frequent than in the adult, and the rose-spots return with the fever. There is generally a desquamation which is distinguishable from that of scarlet fever only by the absence of the large plaques of skin that appear in the latter disease. There are two distinct forms of typhoid fever—a very slight one, of short duration, and a severe form, more curable than in adults. The causes of the less severity are perhaps the good digestion, the development of the lymphatic system, and the general good condition of heart, kidneys and liver. Frequent complications are meningitis, paralysis and otitis. —*American Journal of Obstetrics.*

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THE MUNICIPAL CONTROL OF SCARLET FEVER.*

BY MAURICE OSTHEIMER, M.D.,
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Philadelphia.

The Board of Health endeavors to prevent the spread of the infectious diseases. For this purpose certain laws have been made, prescribing regulations for the prevention of the infectious diseases, which regulations ought to be thoroughly known and well understood by every practicing physician in the city. To make clear the exact position taken by the Philadelphia Board of Health in attempting to control the spread of scarlet fever is the aim of this paper.

In a typical case the procedure is simple. Just as soon as the attending physician is sure that he has a case of scarlet fever, it is his duty to send to the Board of Health one of the post-cards specially prepared and distributed for reporting the infectious diseases. (These post-cards may always be obtained at Room 716, City Hall.) As soon as this post-card reaches the office of the Board of Health the medical inspector in charge of the district in which the case is located receives notice of the case by telephone, and it is his duty to visit the house of the patient as soon as possible. If the case is to remain at home, his orders are to place a placard on the front door and another on the back gate. He has to ask a series of questions, as he has a blank to fill out. He must inquire into the origin of the disease and must see that the patient be properly isolated. He must find out what schools and Sunday-schools children from the house in question attend; where and by whom wage-earners are employed; in what sort of occupation they are engaged; who the milkman is who supplies the family and whether the milk is delivered in bottles. He should also thoroughly inspect the sanitary condition of the premises; should learn how recently inmates of the house have been vaccinated, and should urge immediate vaccination upon all unvaccinated individuals. While this will not, of course, affect the case of scarlet fever in the house, it may help to prevent a future epidemic of small-pox. At this visit the medical inspector does not see the patient, unless specially requested to do so by the attending physician.

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* Read before the Philadelphia Pediatric Society, November 9, 1909.

Tracing scarlet fever is often impossible, but efforts to find the origin of a case frequently meet with success. On this account the source of the milk supply is important. If milk be delivered in bottles, all bottles which enter the premises must remain there until after disinfection by the Board of Health. In regard to isolation, it is not considered possible on the ground floor of a Philadelphia house. If a patient with scarlet fever is to remain at home he must be kept upstairs. Unless he is well isolated and attended by a trained nurse or other competent person, who remains isolated in the room with the patient, the premises are quarantined, *i.e.,* a policeman is stationed at the front and another at the back of the house, and no one is allowed to enter or leave the premises. But wage-earners who wish to move into houses in which there are no children are permitted to go after taking a carbolic bath and having their clothing disinfected by the Board of Health. They are then permitted to return to work. School children are excluded from schools and Sunday-schools during the time the patient remains at home. They are not permitted to move out (except under exceptional circumstances), as it is inconceivable that young children will remain away from their parents long.

The names and addresses of employers are needed, because all inmates of houses in which scarlet fever exists are prohibited from working in any establishment for the manufacture or sale of wearing apparel, upholstery, house furnishings, bedding, cigars, cigarettes or food stuffs. The medical inspector also may exclude from work any person whose work brings him or her into contact with a number of persons daily. It is his duty to notify employers of the occurrence of scarlet fever in houses in which their employees reside; to exclude the employees from work, and to permit their return to work after disinfection of their clothing and their removal to premises in which there are no children. The medical inspector arranges for the disinfection of milk bottles every week or ten days and notifies the milkman not to remove these bottles until they have been disinfected by the Board of Health.

The Board of Health will furnish a sterilized gown in a telescope bag, which the attending physician can put on before entering the sick-room. The treatment of the case is left entirely and absolutely in the hands of the attending physician, until he returns to the office the post-card, requesting disinfection, sent him by the medical inspector on the day the case was first reported. Then the medical inspector again visits the house, examining the patient this time, to see whether desquamation is complete and whether there remains discharge from nose or ears. If the patient is well, disinfection of the rooms in which the case has been isolated follows; but, for this, a minimum period of twenty-one days from the onset of the disease must have elapsed. When at this visit the medical inspector considers desquamation unfinished or finds continued discharge from an ear, he does not order disinfection. If the attending physician objects to this decision, one of the diagnosticians of the department, Drs. Welch and Schamberg, is sent to determine whether the case is ready for disinfection or not. If ready, the disinfection follows on the next day, with removal of the placard. School children are then allowed to return to school at once.

If, however, isolation of the patient is impossible, or circumstances are such that the patient cannot remain at home, it is best for the attending physician to telephone to the Board of Health as soon as he has made the diagnosis of scarlet fever, requesting removal of the patient to the Municipal Hospital for Contagious Diseases. But even if he reports the case by telephone, it is imperative that he also fill out the regular post-card for reporting the infectious diseases and mail it; for it is only upon the receipt of this official card that the clerks in the office of the Board of Health prepare the large envelope into which all records of this case are finally filed. When the patient is sent to the hospital, children in the house are excluded from school and Sunday-school for at least one week; and it is the duty of the medical inspector to visit them when this time expires in order to see that they are all well before permitting their readmission to school. The house is disinfected the day after the patient has left for the hospital, and no placard is placed on the premises.

When a physician sees a case in which he cannot positively make the diagnosis, but considers scarlet fever probable, he can telephone to the Board of Health, requesting that the medical inspector of that district visit the case and make the diagnosis. If the medical inspector is also puzzled he calls upon the diagnosticians; and in some doubtful cases, where it is manifestly impossible to leave a possible case of scarlet fever at home, as in a big boarding house or crowded tenement, the patient is removed to one of the observation pavilions of the new Municipal Hospital.

There are, and always will be, however, cases of scarlet fever in which the diagnosis is not made. These, if treated at all, appear to be simple cases of tonsillitis; and in a few cases an eruption is not observed because it is not sought for, or the parents are too ignorant to notice it. But these cases are usually found during the stage of desquamation. If a physician should discover what appears to be the desquamation which follows scarlet fever and the patient is known to have had a sore throat some weeks before, the Board of Health should again be notified by post-card; or if the case is to go to the hospital, by telephone and by post-card. A few cases are discovered only when a physician is called to treat what is apparently simply a case of nephritis or one of otitis media; but the antecedent history again points to an undiagnosed and untreated attack of scarlet fever as the cause. But all cases of desquamation are not scarlet fever.

Should the medical inspector suspect that the case is not properly isolated or that persons enter the house who are supposed to be living elsewhere, or that the nurse goes all over the house, he is at liberty to quarantine the premises, allowing no one to enter or leave. When the family promises to comply with the regulations of the Board of Health this quarantine is removed.

There are several minor matters which should be brought to your notice in this connection. Some physicians recommend dismantling the sick-room; rugs, portières, etc., are hastily removed, although the patient has usually been in the room during some days. Others, who do not advise this, watch it or notice it at a subsequent visit. All articles removed in this manner ought either to be disinfected at once or they may be kept in a closed room until final disinfection is done. Many of the so-called "return cases," cases occurring in a house after the recovery of a patient kept at home or the return of a patient from the Municipal Hospital, are due to contact with upholstery or clothing which, once infected, has never been disinfected. Return cases may also be due to contact with children no longer isolated whose ears are still discharging. Institutions, too, to which boxes of clothing are sent as donations, would often save an outbreak of scarlet fever if they would adopt, as a routine precaution, the disinfection of all such donations before distributing the garments among the inmates. Twice, in my limited experience, have epidemics of scarlet fever in institutions been traced to gifts of clothing which should have been disinfected. In one case recently a clergyman spent an afternoon with a child desquamating after scarlet fever, in spite of the placard on the house, and wearing a heavy winter suit, carried the disease to two of his own children and to several of those attending Sunday-school the next day.

The cases of so-called "surgical" scarlet fever must not be omitted. These commonly follow some accident, especially a burn. They are undoubtedly infectious and must be isolated like other cases of scarlet fever, as Dr. Schamberg has pointed out. They are probably due to the accident suddenly diminishing vital resistance, so that the germs already in the nose or mouth seem able to produce scarlet fever immediately. Hospitals, therefore, which admit cases of burns, ought to isolate every such case for from three to seven days at least. In this connection I might cite the case of a nurse in our Municipal Hospital, on duty for two years in the scarlet fever wards without contracting the disease. But, after being severely burned, scarlet fever developed within forty-eight hours.

Sufficient stress cannot be laid upon the importance of reporting every case of scarlet fever just as soon as the diagnosis is made. Only when this is done can the spread of the disease be prevented. The sources of contagion may be found and eradicated; other inmates of the house are prevented from carrying the disease; the children are kept away from schools and Sunday-schools; and all visitors are excluded. That these precautions, taken promptly by our Board of Health, are of great value in preventing the spread of scarlet fever cannot be doubted; but with the co-operation of every practicing physician in the city, who will report each case immediately and will tell the families of patients about the coming visit of the medical inspector, and how best to answer his questions, the municipal control of scarlet fever will be even more effective than it is now and the spread of the disease will be decidedly diminished.

118 South Twenty-second Street.

THE COMPLICATIONS OF SCARLET FEVER.*

BY S. S. WOODY, M.D.,
Philadelphia.

In a disease like scarlet fever it is a most difficult matter to draw any distinct line between symptoms and complications. It is obvious that the consideration of all conditions that might arise in the course of a disease capable of presenting symptoms so many and varied, is impossible in the time allotted to the average paper. Therefore, there will be discussed only those complications that are most frequent.

Probably the most common complication of scarlet fever is otitis, which is found with a frequency of 10 to 15 per cent., and is due to an extension of the infection from the nasopharynx through the Eustachian tube into the middle ear. The organism most commonly found is the streptococcus. Otitis occurs oftener in the septic attacks, making its appearance usually at the end of the second week, though it may arise in any type of case and at any time after the first few days. Age and season seem to play important parts, as evinced by the fact that the frequency of otitis decreases with age (being rare after the fifteenth year), and that it occurs oftener during the winter months. Sex appears to have no influence. The ear complication may manifest itself either as a simple catarrhal inflammation, which is trivial and of short duration, or as a suppurative otitis media resulting in a muco-purulent discharge following incision or spontaneous rupture of tympanic membrane. These symptoms are sharp, shooting pain, tenderness, and irritability of temper, often preceded by a sudden rise of temperature and enlargement of the glands below the ear. In one to three days, upon the appearance of the discharge, the symptoms usually disappear. The discharge generally ceases after two to four weeks, to be followed by a rapid healing of the ruptured membrane. It may become chronic, persisting for months, or even years, in which event the mastoid autrum is most likely involved. Here operation is advised by some for the relief of this chronic condition and to avoid the possibility of more serious complications. At any time after the appearance of a suppurative otitis media, there may develop by extension an acute inflammation of the mastoid cells, with symptoms of pain over the mastoid, more or less tenderness, redness and edema, hectic fever, rapid and irregular pulse, restlessness, and occasional rigors and vomiting. At this time the aural discharge has most likely diminished, but rarely has ceased. Should the discharge be re-established, the symptoms may abate, but in almost every instance the condition will recur. One must not forget that a true and dangerous mastoid inflammation may exist without the local manifestations referred to above. The inflammation of the mastoid cells may, through the patency of the interstices of the mastoid, extend to the surface, causing a subperiosteal abscess, which may be plainly felt as a soft, fluctuating swelling. This condition might be confused with an abscess resulting from a breaking-down of the post-auricular glands, or with a subperiosteal abscess due to an extension of the suppurative process from the auditory canal between the bony and cartilaginous portions.

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* Read before the Philadelphia Pediatric Society, November 9, 1909.

If a suppurative mastoiditis does not empty itself into the middle ear or externally through the mastoid, because of thickness of the bony mastoid and lack of patency of its interstices, there is danger of serious intracranial complications. This may take the form of a suppurative meningitis, a lateral sinus thrombosis, or a subdural, temperosphenoidal, or cerebellar abscess. A chronic otitis media may result in a partial or complete deafness, or a facial palsy; and a mastoiditis, if not properly treated, may end in general pyemia and death. Mastoid inflammation occurs in about one-half of 1 per cent. of all cases of scarlet fever.

Adenitis as a complication is not the early glandular swelling seen in all cases of scarlet fever, nor is it the more pronounced involvement with cellulitis of the neck, frequently encountered in these severe and septic attacks. These conditions are due to the primary cause, and are but manifestations of the different types of the disease.

Adenitis, as a true complication, is the adenitis of convalescence, occurring when the temperature has been normal from one to three weeks. It is attended with a rapid swelling of one or more of the cervical glands, generally those behind the jaw, and with sudden rise of temperature lasting from two to three days, dropping rapidly to normal with resolution. The fever and the course may be prolonged if suppuration occur, which happens in about one-third of all cases.

There appears to be no definite local cause, but certain general conditions have been observed to favor its development. Variations in atmospheric and soil conditions have been shown to be a potent etiological factor, as demonstrated by the occurrence of cases in groups and in different parts of a hospital at the same time. It occurs more frequently before puberty and in these cases already complicated with nephritis or albuminuria; also has a tendency to follow the severer attacks. Sex and season seem to have no influence. Adenitis complicates 11 per cent. of all cases of scarlet fever and always terminates in recovery.

In speaking of *nephritis* as a complication, the early or febrile albuminuria of scarlet fever will not be considered, since it is due to the elimination of the toxins, and plays the part of a mere symptom, as it frequently does in other fever conditions. Nephritis, following scarlet fever as a genuine complication and exhibiting the typical pathological changes, occurs usually around the third week of the disease, most commonly between the sixteenth and twenty-third days, and is seen in about 10 per cent. of cases. The condition may be nothing more than a continued albuminuria, or it may present all the symptoms and urinary findings of an exaggerated nephritis. In any of these variations of renal inflammation the morbid processes are most probably the same, a glomerulonephritis. This is evidenced by the fact that all types seem dependent upon the same predisposing conditions, such as deficient ventilation and overcrowding, the association of cold and dampness, and the simultaneous grouping of mild and severe cases in different wards of the same hospital. Nephritis of all grades is most common in larger children, while the milder forms predominate after puberty. Likewise, both sexes are equally susceptible up to the age of puberty, after which time males are more prone to the affliction. The mildness or severity of the initial scarlatinal attack is never an index to the gravity of the renal disturbances that may follow. Nephritis, as a complication of scarlet fever, is frequently coexistent with adenitis, and has been noticed especially in subjects previously complicated with arthritis.

The onset of renal trouble in many cases is gradual, showing itself first by drowsiness and general indisposition, slight pallor of the face, some puffiness of the eyes and a modicum of increase in temperature. An examination of the urine will reveal a moderate amount of albumin, with or without casts and blood. Measuring the urine will disclose a decreased daily output. The patient may become progressively worse with the resultant development of nephritis of more pronounced character. In these cases of slow onset it is seldom, with simple and proper treatment, that the symptoms assume any alarming phases, though they may show a great tendency toward a protracted course.

Attacks of nephritis with acute sudden onset are less common than the above, and are ushered in with vomiting, severe frontal headache, chill, marked rise in temperature (102° to 104° F.) and various nervous phenomena, such as drowsiness, somnolence, stupor, convulsions and coma. The urine will be highly colored and smoky, and an analysis will show the presence of albumin and casts in variable quantities. Red blood cells are an almost constant microscopical finding. The quantity of urine will be diminished, and, during the febrile stage, there will be noticed a more or less marked period of suppression, which reaches its height about the third or fourth day after onset of symptoms. At this time the clinical picture, as regards the skin, tongue, pulse and respirations, is that of any nephritis approaching uremia. Moderate anasarca, involving the face, hands and feet, and amaurosis, partial or complete, are occasionally encountered. This febrile period lasts from three to six days, during which time the fever is irregular and the pulse variable in rhythm and quality, often becoming unusually slow toward the end. With the re-establishment of diuresis the symptoms abate and the patient goes on to gradual recovery.

The prognosis in scarlatinal nephritis is good, most cases resulting in complete recovery. Occasionally, albuminuria, attended with a consequent anemia, persists for a long time; but even here the tendency is toward ultimate cure. A true chronic nephritis rarely follows nephritis of scarlatinal origin. The few fatalities met with are due to edema of the lungs or to uremia. In the latter, persistent headache and vomiting and long-continued convulsions or coma, are symptoms always of dire omen.

Arthritis, or scarlatinal rheumatism, has been so designated, and aptly, too, because of its close resemblance to ordinary acute rheumatism. The similarity is shown by a proneness to develop in patients of a rheumatic diathesis, by a tendency to migrate from one joint to another, and by a prompt response to the action of salicylates. It is unlike acute rheumatism in that it is not so severe, is less likely to affect the heart and pericardium and tends toward ultimate recovery. Scarlatinal arthritis, however, more often results in suppurative conditions of the joints and in pyemia than does acute rheumatism. When the acute symptoms of scarlet fever are just subsiding, about the sixth or seventh day, arthritis presents its first symptoms, namely: a rise in temperature, with marked irritability and discomfort on the part of the patient, especially noticeable when being handled. A close inspection will show swelling and effusion of the joints with pain and tenderness. The smaller joints are more commonly involved than the large ones, and those of the upper extremities more often than those of the lower extremity. The metacarpophalangeal, the wrist and the smaller articulations of the hand are those most commonly affected. The suppurative form is more likely to be seen in septic attacks with ulcerative angina and is a later complication than is the serous type. It attacks by preference the elbows, knees and the larger joints.

Scarlatinal arthritis is more common in females, in adults and older children, and in serious cases is attended with well-marked rash and profuse desquamation. Season and temperature are of no material import as predisposing factors. The prognosis of arthritis is always good except in the suppurative forms, where it is distinctly bad, death from septicemia and pyemia being the almost inevitable result. Cardiac complications following arthritis are exceedingly uncommon. The frequency of scarlatinal rheumatism varies in different countries and in different epidemics from 3 to 13 per cent., with an average of 6 per cent.

Secondary angina or *tonsillitis* may occur at any stage of the disease, but more often after the acute symptoms have subsided. It occurs with greater frequency in adults, in females, in those of a rheumatic tendency, and in those giving a history of repeated attacks of sore throat. It is due to an infection entirely foreign to that causing the primary illness. Ordinarily, it is a follicular tonsillitis of mild character and sometimes terminates in quinsy or peritonsillar abscess. In smaller children it may assume a more virulent aspect with extensive ulcerations of the tonsils and fauces and severe constitutional disturbances, resulting sometimes in death. It complicates 3 per cent. of cases.

Ulcerative stomatitis occurs in 1½ per cent. of cases and with degrees of severity ranging from a simple gingivitis to a gangrenous condition of the mucous membrane and the underlying tissues. It usually begins as a spongy, boggy condition of the gums, which bleed upon the slightest provocation, and is frequently associated with ulceration at the free border. Having its starting point about a carious tooth, it is likely to spread laterally and may attack the edge of the tongue or the mucous membrane of the cheek and lip. In a short time shallow, irregular ulcers will appear, showing a dirty, grayish membrane-like base surrounded by a more or less indurated border, from which radiates a fiery-red areola. Frequently there will be noticed swelling of the face, and, if the buccal mucous membrane be involved, there will be felt a distinct induration of the cheek. At times, in a convalescent, the swelling and the irritability will be the first signs of stomatitis. Other symptoms of the milder forms are swelling of the submaxillary glands, fetor of the breath, excessive salivation and very little, if any, fever.

If the condition assume the more aggravated phases, the ulceration will spread and deepen, resulting in necrosis and actual sloughing. The teeth usually loosen and fall out, while the gums peel away from the alveolar processes and expose the bone. Very rarely the process of ulceration with sloughing may involve the entire mucous membrane of the cheek, when the condition becomes like that commonly designated as noma. There is gradual profound toxemia, with markedly progressive acceleration and enfeeblement of pulse. The temperature is but moderately elevated. Most of these severe cases terminate fatally. The offending organisms most commonly found are a diplococcus, probably the pneumococcus, and the spirillum and the fusiform bacillus of Vincent. Owing to the profusion in which the latter occur in many cases, it is most likely that in these instances the pathological process might be the same as that in Vincent's angina. An abundance of these organisms is most often present in the more serious and fatal cases. Ulcerative stomatitis most commonly attacks younger and strumous children, and those who may be so extremely unfortunate as to have superadded to the scarlatina an attack of measles. The development of several cases of stomatitis together in the same ward of a hospital might indicate that the disease is contagious.

Bronchopneumonia develops as a large manifestation of a septic attack and is an inspiration pneumonia caused by food particles or secretions from the throat. It may be, however, but the expression of a virulent attack in a person whose powers of resistance are unusually low. In this event, it would be but part of the picture of the disease. Bronchopneumonia occurs with a frequency of 1 per cent. and the prognosis is always grave.

Relapse and second attacks constitute a most interesting feature in the study of scarlet fever complications. A relapse may be defined as a return of the characteristic symptoms at any time between the tenth and eleventh day of the primary onset and the end of convalescence. It is essentially a condition of secondary infection by the primary causative agent still in the person, and made possible because the immunity conferred by the preceding illness has been incomplete or too short-lived. Relapses are rarely fatal, though at times they may be quite severe; the severity usually being in inverse ratio to that of the preceding attack. Instances are on record of two or three relapses in the same person, although this is exceedingly rare. The recurrence of the scarlet fever symptoms in a scarlet fever patient is probably more common in hospital wards, the cause seeming to be that the contagious agent is here in greater concentration, and that the patient's immunity has been of insufficient duration. These instances should be termed second attacks, because here the patient receives the infecting agent from without. If the immunity be of sufficient duration to protect until the patient be away from the infected atmosphere, a period of two to six years usually will elapse before he receives the second attack. Second attacks may occur after longer intervals (ten or fifteen years), but very rarely. Multiple attacks are recorded, but regularly recurring attacks are probably cases of erythema scarlatiniforme. (Welch and Schamberg.)

There are many grave conditions, such as *retropharyngeal abscess*, Ludwig's angina, and perforating ulcer of the soft-palate, which occasionally occur during the height of an attack of the septic type; but since they are mere manifestations of the exaggerated forms of the disease, and part and parcel of the clinical picture, they should not be considered as complications. There are, however, numerous minor intercurrent complications which come on later in the course of scarlet fever, and which seem to arise independent of the scarlatinal poison. Among these are pericarditis, endocarditis, purpura, eczema, impetigo and furunculosis.

One of these minor complications, which is also a very frequent one, is *rhinorrhea;* not the characteristic serous or serosanguinous thin and straw-colored discharge of the anginose attacks, but the rhinorrhea beginning as a simple "running nose" and after convalescence is well under way. It is very unyielding to treatment and is apt to run a protracted course, in which event there may be ulceration of the nose and nasopharynx. This affection occurs more commonly in the smaller children and in those having adenoids. It becomes chronic oftener in this latter class of children.

In conclusion, should be mentioned the frequency with which scarlet fever seems to leave a fertile soil for the development of other infectious diseases, such as measles and diphtheria, more especially the latter named.

CHILDREN OF TUBERCULOUS PARENTS.—Of 150 children of tuberculous parents examined by J. A. Miller and I. O. Woodruff (*Journal American Medical Association,* March 27, 1909) 51 per cent. were found to be infected with tuberculosis. These observers claim that the earliest manifestations of such tuberculosis are not found in the superficial glands or in the bones and joints, but in the lungs. The physical signs of these early pulmonary lesions, in children under ten years of age, are very rarely those usually found in adults, but consist more often in the presence of persistent fine râles just without the midclavicular line in the fifth and sixth intercostal spaces. In other cases in which persistent sibilant râles are present in varying portions of the chest, the diagnosis is doubtful, but they should be regarded with suspicion. The tuberculin tests furnish the most reliable means of diagnosis of tuberculosis in children. The writers regard the hypodermic test in doses up to 5 mg. as positively diagnostic. Of the local tests the cutaneous is more reliable in children than the ophthalmic and presents none of its possible dangers. It has been fully corroborated by the hypodermic test, and consequently is regarded as a reliable and safe means of diagnosis of tuberculosis in children. Examination of the sputum, as usually practised, is of almost no aid in the diagnosis of early pulmonary tuberculosis in children. As a routine procedure it is not very feasible in dispensary practice.—*American Journal of Obstetrics.*

DIFFICULTIES IN THE DIAGNOSIS OF SCARLET FEVER.*

BY JAY FRANK SCHAMBERG, M.D.,
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Of all of the eruptive fevers, scarlet fever presents the most perplexities in diagnosis. Difficulties are encountered when the complex of symptoms is incomplete or when the individual symptoms are poorly developed and uncharacteristic. On the other hand, errors are apt to arise from the confusion with scarlet fever of conditions presenting scarlatinoid symptoms, but in essence unrelated.

The diagnosis is facile, even to the youngest disciple of Aesculapius, when a complete and classic picture is presented. No one could mistake a disease ushered in by sudden vomiting, high fever, prostration, red and swollen throat, a generalized punctiform erythema, enlarged glands, strawberry tongue, and followed by desquamation, otitis media and albuminuria. But, unfortunately, the syndrome is frequently incomplete, and the various symptoms upon which a diagnosis is based are commonly poorly marked or even absent. There is a distinct relationship between the intensity of the various manifestations: high fever is usually accompanied by a profuse rash and a pronounced angina. On the other hand, in mild cases the fever is often slight, the angina poorly developed and the rash ephemeral and uncharacteristic.

Obscurities in the diagnosis of small-pox and measles are usually clarified by a further observation of the patient. With scarlet fever even a delay of a few days in the pronouncement of the diagnosis will not always conduce to a satisfactory judgment. In some cases the further course of the disease casts sufficient illumination upon the nature of the process, but quite commonly the survey of the case in the light of all of its subsequent developments leaves the diagnosis in doubt. It is a humiliating admission to make, but the interests of truth demand that the limitations of our knowledge be frankly confessed.

No one symptom of scarlet fever may be relied upon to establish the diagnosis. A proper conclusion as to the nature of the disease can only be arrived at by a consideration of the associated symptoms; the most important of these is the presence of a distinct angina accompanied by a generalized scarlatinoid eruption. In the light of our present knowledge, and in consideration of the public interests involved, the association of these two symptoms compels us to make the diagnosis of scarlet fever.

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In treating patients with an acute sore throat, it is inadvisable to administer any drugs which are capable of exciting an eruption of a scarlatinoid character for, if such a rash appear, Hippocrates himself would be unable to exclude scarlet fever from the diagnosis. The drugs which are most likely to produce an eruption of this character are quinin, the salicylates, veronal, antipyrin, calomel, belladonna, etc.

I have seen patients suffering from an angina in whom, after the administration of salicylates, a scarlatinoid rash has appeared. The perplexing problem was here presented of differentiating between scarlet fever and a drug eruption complicating a sore throat. Where the diagnosis of scarlet fever cannot be excluded, our duty to the public demands that the patient be treated as if he were suffering from this disease.

Eruption.—The eruption of scarlet fever is the most conspicuous and most suggestive manifestation of the disease, but is not sufficient in itself to base a diagnosis upon. There are many other diseases and conditions in which an indistinguishable rash may appear. Scarlatinoid rashes may appear during the prodromal stage of small-pox, chicken-pox and measles, and may likewise occur early in the course of malaria, typhoid fever and septicopyemia. I have seen varicella patients who have developed a day or two before the appearance of the vesicular eruption a mild generalized scarlatiniform rash strongly suggestive of scarlet fever. On one or two occasions such patients have been sent into the scarlet fever wards of the Municipal Hospital. I recall one such patient who five days later contracted scarlet fever, thus proving that the previous rash was not scarlatinal in nature.

Some years ago I saw at a seashore resort a child who became ill with fever and a scarlatinoid rash. I feared scarlet fever, but in twenty-four hours this rash disappeared and was followed by a typical measles eruption with the usual associated symptoms. I have seen a generalized scarlatinoid eruption of moderate intensity inaugurate the onset of a typical intermittent fever. This patient in the beginning was sent to the Municipal Hospital as a case of scarlet fever.

Billet, in 1892, referred to a case of a French soldier who was sent into the Constantine Military Hospital supposed to be suffering from scarlet fever. The disease proved to be malaria with a scarlatinoid erythema, which subsequently recurred twice with the onset of paroxysms. Malarial organisms were found in the blood. Marchiafava and Bignami refer to the occurrence of a diffuse scarlatiniform rash in the course of pernicious malarial fever.

Bastianelli and Bignami have described a case of malaria with a diffuse scarlatinoid rash covering the entire body accompanied by erythema of the fauces. Desquamation occurred in large scales. Three days later the rash reappeared.

Scarlatinoid rashes may also occur late in the course of various infectious diseases. The rash under such circumstances is commonly the expression of a septic condition, often a streptococcic infection. Such rashes not infrequently occur about the end of the second week of the small-pox eruption, when they are associated with other profound septic manifestations. Cases of this character have on numerous occasions been diagnosed as intercurrent attacks of scarlet fever.

Diphtheria antitoxin and other sera may produce scarlatiniform rashes so closely simulating the eruption of scarlet fever as to defy all efforts at satisfactory differentiation. Men of experience are agreed that in many cases of this kind it is beyond human skill to pronounce definitely as to the nature of the process.

It is thus seen that a scarlatiniform rash, occurring in a variety of morbid conditions, may strongly counterfeit the rash of scarlet fever. Undue weight must, therefore, not be attached to the presence of this symptom.

Etiologic Evidence.—The diagnosis in cases of doubtful scarlet fever is often clarified by the discovery of the disease in a person to whom the patient has been exposed. In institutions for children the existence of an epidemic often clears up an individual diagnosis which, under ordinary circumstances, would remain in obscurity. Careful examination and inquiry will sometimes discover a mild and unrecognized case of scarlet fever, perhaps in the stage of desquamation, to be the origin of an institution epidemic. The diagnosis of scarlet fever is sometimes confirmed by the disease being transmitted by the suspected patient to another person. The presence of an epidemic of scarlet fever in a community is also evidence not to be disregarded.

Condition of the Tongue.—In the very beginning the tongue in scarlet fever is heavily coated with a whitish fur, through which scattered, red papillæ are frequently visible. In about forty-eight hours the coating peels off, exposing to view a red tongue studded with enlarged papillæ. This condition of the tongue is certainly a symptom of considerable diagnostic value, and its presence or absence in doubtful cases should be determined and considered in formulating the diagnosis, but several sources of error must be kept in view. In very mild cases of scarlet fever, in which the rash and general symptoms leave doubt as to the nature of the disease, the tongue often fails to present its characteristic appearance. I have frequently seen children in scarlet fever wards with uncharacteristic tongues. On the other hand, the tongue in well pronounced cases shows a variable amount of prominence of the lingual papillæ. Any one who will make a routine study of the tongue of all of his patients may satisfy himself that there are wide variations in the size and prominence of the papillæ in health. Further, in rare instances the strawberry tongue may be seen in affections other than scarlet fever. I have observed it in a few severe cases of scarlatiniform erythema occurring in the course of small-pox. I have also seen great enlargement of the papillæ associated with a recurrent desquamative erythema in a pregnant woman.

These exceptions, however, do not invalidate the force of the statement that a tongue coated with whitish fur which rapidly peels off and leaves a red papillated surface is strong confirmatory evidence of scarlet fever. The negative value of the absence of the characteristic tongue is of less importance.

Desquamation.—There is too much tendency to regard desquamation after a rash as necessarily confirming the scarlatinal nature of the affection. It cannot be too strongly expressed and impressed that "all that scales is not scarlet." Scaling is the terminal stage of certain pathologic changes in the skin which are by no means peculiar to scarlet fever. There are many rashes which are followed by desquamation, notably those included under the designation "scarlatinoid" or "scarlatiniform erythema." Many authors, including Louis, Murchinson, Strümpell, Osler and others have described desquamation occurring after typhoid fever. A profuse desquamation may occur in malaria, pneumonia, rheumatic fever, miliaria fever and other conditions in which a sudaminous or sweat eruption may take place.

I have frequently seen patients with small, round or oval patches of desquamation upon the palmar surface of the hands and fingers, due to free sweating. This affection, which might appropriately be designated "desquamatio sudoralis," has led in a number of instances to the exclusion of children from the public schools on the suspicion that the scaling was due to scarlet fever.

Too much importance has been attached to the mere occurrence of desquamation in scarlet fever; the time of the onset of scaling, its mode of progression, and the persistence are of more diagnostic importance.

Desquamation in scarlet fever is usually observed first on the face. This is often seen from the fourth to the fifth day. About the sixth day the same process is noted on the neck and upper portions of the chest. The hands ordinarily begin to desquamate from the twelfth to the fourteenth day. On the feet scaling may not commence until the third week.

Scarlatinoid eruptions, in my experience, begin to scale more quickly, particularly on the hands and feet. I have seen a well-marked scarlatiniform eruption occurring in small-pox lead to exfoliation of large pieces of the palmar and plantar epidermis on the sixth day. I believe also that scarlet fever scaling persists longer than scaling after scarlatinoid rashes. I should not insist on the correctness of this observation, however, as scarlet fever patients are scrutinized more closely and for a longer period than the non-scarlatinal cases; minute desquamation would thus be detected for a long time in scarlet fever and be overlooked, perhaps, in other conditions.

A form of scaling which is commonly seen in scarlet fever is that which begins just beneath the free border of the finger nails, extending thence down the fingers and exposing to view the new pink epidermis beneath. This appearance is so frequently present as to be suggestive of the disease.

I would not be understood as asserting that general desquamation has not a diagnostic importance. A mild scarlet fever rash will often desquamate in a pronounced manner, particularly on the hands and feet. An erythema of similar intensity, due to some other cause, may not desquamate at all. But it must not be forgotten that there is a scarlatinoid rash which may be produced by the administration of certain drugs, and by varied toxic states, which is followed by most profuse desquamation, exceeding, if anything, that of scarlet fever. This form of *desquamative scarlatiniform erythema* and the milder forms of scarlatiniform erythema may occur during the course of various infectious processes, such as small-pox, measles, varicella, malaria, typhoid fever, rheumatism, septicemia and pyemia, etc., etc. Diphtheria antitoxin and other sera may also evoke an eruption quite indistinguishable from that of scarlet fever.

The drugs which are most likely to produce scarlatiniform rashes are quinin, salicylic acid, antipyrin, mercury, belladonna, veronal, chloral, opium, etc. I have seen veronal produce a scarlatinoid rash accompanied by fever which could be only differentiated from scarlet fever after a second administration had produced a recurrence of the symptoms.

Eruptive Fevers Simulating Scarlet Fever.—While it is most easy to differentiate measles and scarlet fever in the text-books, it is not always a simple matter at the bedside. I have often seen children with a mild scarlet fever who were at the same time suffering from catarrhal symptoms from an influenza or an ordinary "cold." Measles is often closely simulated in such cases, particularly when the rash is slight or uncharacteristic. On the other hand, in severe cases of measles, the rash may become so confluent as to strongly suggest scarlet fever. Ordinarily, however, the differential diagnosis presents no difficulties.

I am convinced that many cases of rubella, particularly of the scarlatinoid type, are diagnosed as cases of scarlet fever. The presence of mild catarrhal symptoms, the ephemeral character of the eruption and the relatively slight elevation of temperature aid in the diagnosis.

Scarlatiniform Erythema.—It is often a matter of great difficulty to differentiate "scarlatiniform erythema" from true scarlet fever. In the former the invasive symptoms are often extremely mild; the patient commonly does not complain of feeling ill; the temperature elevation is slight, perhaps 101° or 102° F. The throat may be reddened, but the tonsils and uvula are not swollen, and exudate is not present on the tonsils. The reddened papillated tongue is, as a rule, absent. The eruption may begin on any portion of the body; it may be patchy or irregular, or it may be diffuse with or without punctation. The glands at the angles of the jaws are not apt to exhibit any pronounced enlargement; albuminuria is rare and otitis media does not occur.

It is thus seen that scarlatiniform erythema may be readily distinguished from a well-pronounced attack of scarlet fever, but the fact must not be overlooked that there are many mild cases of scarlet fever in which the fever is slight, the eruption poorly marked and the other symptoms correspondingly uncharacteristic.

The significant feature in scarlatiniform erythema, particularly when the rash is well pronounced, is that the intensity of the eruption is out of all proportion to the amount of constitutional disturbance. There is not present the prostration and high fever which would accompany a rash of similar severity in scarlet fever. Furthermore, there is seldom, if ever, seen in scarlatiniform erythema a severe sore throat with edema of the uvula and soft palate. Another point of great diagnostic importance is the history as to previous attacks, the tendency to recurrence being a well-recognized feature of scarlatiniform erythema.

Cutaneous burns are sometimes accompanied by erythematous eruptions, which bring the diagnosis of scarlet fever into consideration. I have seen quite a number of such cases and have come to the conclusion that many, or, indeed, most, of these rashes represent true scarlet fever. The temperature is usually high, 103° to 105° F., but, as a rule, the throat and tongue exhibit but little evidence. The rash is usually not vivid, but rather of moderate or slight intensity. The following is an illustrative case: A colored child was admitted to the Polyclinic Hospital suffering from a severe burn. About forty-eight hours after admission the temperature rose to 105°F., and a scarlatiniform rash appeared on the body. Nothing characteristic was observed in the throat or on the tongue; nevertheless, the child was isolated and a special nurse assigned to attend it. Four days later this nurse fell ill and passed through a well-pronounced attack of scarlet fever. The circumstances were such as to leave no doubt as to the source of the nurse's attack. I am of the opinion that burns in some manner greatly increase the patient's susceptibility to scarlet fever. Operations upon the nose and throat exert a similar influence, and scarlet fever is not uncommon after operations for adenoids, deviation of the septum, removal of the tonsils, etc. The puerperium also heightens the susceptibility to scarlet fever. Some of the scarlatinoid rashes after childbirth are septic in character, while others represent the exanthem of genuine scarlet fever.

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THE TREATMENT OF SCARLET FEVER.*

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In the treatment of scarlet fever it must be constantly borne in mind that the disease is a self-limited and self-curative affection, whose course cannot be shortened or aborted by any specific remedy or any special method of treatment. The mild cases usually recover under the simplest hygienic measures, while in the malignant forms no treatment is of any avail. Hence, the physician must in this, as in other acute diseases, guard against too zealous and officious treatment, especially of the severer varieties; as there is danger, in the frequent application of remedies, of so exhausting the patient's mental and physical strength, that the issue may be unfavorably affected. I wish to emphasize this point, because I think that we are very apt, all of us, to overtreat the acute diseases of childhood—to forget the patient in our zeal to bring about recovery.

General Management of the Patient.—The sick-room of the scarlet fever patient ought to be a large and well-ventilated apartment of a temperature of 65° to 68° F., to which fresh air should be freely admitted, the patient being protected from drafts by properly arranged screens. The fear of catching cold is fallacious; recession of the eruption, when it occurs, is the result of cardiac weakness, and is a part of the disease. The patient should be made comfortable, and should drink freely of water and of cooling drinks, such as flaxseed tea, lemonade, etc. Water is important, and ought to be given regularly and in definite quantities (4 to 6 ounces every three hours). The bowels should be kept open daily, but irritant cathartics, such as calomel, should be avoided. The bed clothes should be of light muslin or linen, supplemented in cold weather with a suitable under-vest.

Diet.—As a general rule, milk should constitute the principal part of the diet for the first two or three weeks (but not in large amounts, because of its high protein content, which may overtax the kidneys, and because it usually provokes digestive disorders if given too freely in acute disease); then starches, farinaceous and green vegetables, light desserts (without eggs), and stewed and fresh fruits for three or four weeks longer; and, finally, meat and eggs as convalescence is established. Milk, however, as just said, is frequently not well borne, and hence is not advisable alone or in large amounts. It must be diluted with cereals and gruels, or omitted altogether and replaced by buttermilk, kumyss junket, ice-cream, or gruels and meal soups, or soups of peas, beans, or potatoes and other vegetables, except asparagus. Because of the irritant effects of the products of proteid metabolism upon the kidneys, animal broths are unsuitable, as objectionable, indeed, as meat itself; but when anemia is marked, or loss of weight occurs one should not hesitate to give meat.

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* Read at a Symposium on Scarlet Fever, Philadelphia Pediatric Society, November 9, 1909.

Rest.—It is my custom to keep the scarlet fever patient in bed until desquamation is complete; that is, for five or six weeks, be the case ever so mild. When there are nephritis and sequelæ the stay in bed must be longer. I believe that by this method the danger of nephritis is lessened, the dissemination of the scales about the room limited, and the care of the patient materially lightened.

Care of the Skin.—The patient should be sponged daily with luke-warm water, and occasionally with soap, especially about the genitals; but inunctions should be postponed until desquamation occurs. The greasing of the surface embarrasses the excretory ducts of the skin and obscures the diagnosis of doubtful cases, since this procedure lessens, or may prevent entirely, the occurrence of desquamation. Pruritus, when excessive, may be relieved by applying calamin and zinc lotion, by sponging with bran-bags (Kellogg), by using the official black wash (lotio nigra), and by applying powders of bicarbonate of soda or of zinc, camphor and starch, with or without menthol. Because of its poisonous properties the use of carbolic acid is not advisable for this purpose.

Urine.—Daily examination of the urine should be made throughout the whole course of the disease. If nitric acid and test tubes are kept in the sick-room the examinations can be made daily, and will occupy but a moment of the physician's time.

Drugs.—The mild cases need no medication beyond the administration of mild febrifuges and diuretics during the febrile stage. Such are the liquor potassii citratis and the spirits of mindererus. Otherwise, the use of drugs is entirely symptomatic, and will be referred to as occasion arises. Septic cases require alcohol in full doses in the form of red wine (port), brandy and whiskey, always well diluted; but, as a rule, because of its irritant action upon the kidneys, the use of this drug is otherwise not advisable. When the first cardiac sound becomes weak and the pulse loses in volume, strychnin is indicated ($^1/_{150}$ to $^1/_{200}$ grain every three or four hours, at five years); the benefit of digitalis is open to question, but it may be used in selected cases (½ minim of the fluid extract or 2 minims of the tincture, at the same age); also tincture of strophanthus (2 to 3 minims), camphor (5 minims of the oil, under the skin), and caffein (by mouth or hypodermically, ½ to 1 grain). Anemia, when profound, is treated most advantageously, especially in young infants, hypodermically (¾ grain of the citrate of iron in distilled water, daily or every other day, after the manner of J. L. Morse). By this method I have had brilliant results. All medication causing gastric disturbance is worse than useless; when drugs have this effect and their use is imperative, they should be given hypodermically or by rectum.

LOCAL TREATMENT AND TREATMENT OF SPECIAL CONDITIONS.

Fever.—Hydrotherapy is the best and safest means of controlling fever in children. Medicinal antipyretics, especially the coal-tar products, are contraindicated. There should be no fear of using cold water in scarlatina, and no harm can result therefrom if judiciously employed. For occasional rises in temperature to 103°, 104° or 105° F., no interference other than a tepid sponge bath at 85° is necessary. When the temperature persistently remains elevated above 103°F., or when there is hyperpyrexia (to 105,° 106° or 107° F.) *particularly when there is great nervousness or restlessness,* systematic bathing should be instituted. Young infants, however, stand cold poorly, and for them the graduated bath (98° or 95° F.; lowered to 85° or 90° F.), or the warm bath alone (90° to 95° F.) should be employed. In older children the temperature may be lower (85°F. lowered to 75°F.); or the cold pack may be used: by the frequent application (every fifteen to twenty minutes) of a wet sheet or towel, extending from axillæ to hips, and wrung out in water at 70° or 80° F.; or the towel may envelop the trunk and be repeatedly sprinkled, first with tepid, and then with colder and colder water, until the patient's temperature falls to 100°F. The temperature of the sprinkled water, however, should never be below 70°F., and the patient's lower limbs must always be encased in blankets, the feet being kept warm and the head cool. Such baths may be repeated whenever the temperature reaches a definite height or the nervous symptoms recur; for it is the nervous symptoms and general condition, rather than the actual degree of heat, that should be our guide in applying hydrotherapy. Other methods of applying cold will suggest themselves to the well-informed physician, who will always see that his patient reacts well and will never forget how depressing cold is to a young child.

Nervous Symptoms and Restlessness.—Nothing meets this indication better than hydrotherapy, particularly the warm bath, at 95° or 100° F., for ten or fifteen minutes. For the severe cases, with hyperpyrexia, violent delirium, cyanosis and cold surface and extremities, the hot mustard bath or pack is often efficient. Sometimes cold affusions act well in these forms, the patient sitting in water at 95°F., while cold water (70°F.) is poured over his head from a height, care being taken to protect the ears. The bromides (5 grains, at five years), chloral (2 grains, at the same age), and suppositories of asafetida (5 grains), valerian (1 to 2 grains), and sumbul (1 to 2 grains) are also useful nervous sedatives.

Throat Symptoms.—During the whole course of scarlet fever the mouth and throat should be daily washed, gargled and sprayed with some mild disinfectant solution (liq. antisepticus alk., 4 per cent.; solution of boric acid, etc.). For the angina, I am partial to the time-honored tincture of iron and chlorate of potassium, mixture, at two to three hours intervals. When the daily dose of potash does not exceed 12 grains at two years, and 24 grains at five years, I believe that its irritant action upon the kidneys can be avoided. The sucking of ice, and the repeated small doses of ice-cream or water-ice, will be found grateful to many patients. In bad cases, with false membrane and sloughing, spraying with peroxide of hydrogen (1 to 1.2 or 3), and irrigations with bichlorid of mercury (1:10,000 or 12,000) or with normal salt solution are indicated; or the throat may be swabbed with Löffler's iron solution (menthol, 10 grains; solve in tuluol ad. 30 c.c.; alcohol absolut., 60 c.c.; liq. ferri perchloridi, 4 c.c.). This is painful, and must usually be diluted (Forchheimer). Gangrenous patches may be swabbed with iodin or injected with a 3 to 5 per cent. solution of carbolic acid in glycerin. True diphtheritic pseudomembrane requires appropriate doses of antitoxin. In the treatment of the throat always endeavor to avoid measures and drugs that occasion pain and considerable resistance by the patient, as such procedures are apt to do more harm than good. (Irrigation of the throat is thus described by Kerley: "The patient's arms are firmly bound by enveloping his body in a securely-fastened sheet. A pus-basin is placed under his mouth. The child is then turned on his right side upon a pillow, and the largest rectal tip of a new fountain syringe is introduced between the teeth at the corner of the mouth. The bag of the syringe is suspended three feet over the patient's head, and a saline solution, interrupted every few seconds, allowed to flow in, the volume of fluid in the mouth always being so small that no inspiration of the water occurs. Only ½ pint is used at first, later 1 quart. The patients are usually rebellious at first and often cough much, but afterward become accustomed to the irrigation.")

Care of the Nose and Rhinitis.—The nose should be cleansed daily by swabbing with cotton moistened with the mild washes advised for the throat, and afterward instilled with menthol in albolene (2 to 3 grains to the ounce). Owing to the danger to the ear, irrigation of the nose is not advisable. If the nostrils are filled with purulent secretions or pseudomembrane, their gentle flooding from a teaspoon with the mild washes may be tried; but the use of douches and syringes is to be condemned. After the nostrils have been cleansed they may be insufflated with calomel. For excoriations of the anterior nares aristol ointment (10 per cent.), calomel ointment (ʒss to ℥ss), and the ungt. hydrarg., nitratis (diluted seven times) are all useful.

The Ear and Otitis Media.—The ears should be frequently inspected during the whole course of scarlet fever. As often, in otitis media, no pain is complained of, restlessness or a sudden rise in temperature should at once direct attention to the ears. Decided bulging of the drum head calls for immediate incision. The operation is equally imperative when there is great pain with tympanic congestion alone. If incompetent to perform this operation, or unfamiliar with the methods of examination, the conscientious physician will secure skilled assistance, as prompt treatment may prevent irreparable loss of hearing. Pain may be relieved by instillations of very hot water, or a 3 to 5 per cent. solution of carbolic acid in hot glycerin (von Pirquet and Shick); or by the application of dry heat (hot-water and salt bags). Sometimes a full dose of an opiate will abort an attack. Instillations of oil, laudanum, cocain, etc., are not to be commended. After the discharge is established careful cleansing of the external meatus with a cotton swab, followed by the instillation of a saturated solution of boric acid in 20-50 per cent. alcohol, is considered better practice by aurists than irrigations, because of the tendency of the latter to drive the infection deeper into the ear. If the discharge continues, instillations of sulphate of zinc (1:300) are useful. Implication of the mastoid demands the ice bag or Leiter's coil; and, if the symptoms progress, surgical interference.

Desquamation.—With the first signs of desquamation daily warm baths with soap and water should be instituted. Simple soap, or thymol or resorcin soap, may be used. The latter I have found most efficacious. Inunctions should follow. Cold cream, lanolin and plain lard are as efficient, and far safer, than unguents containing antiseptics. Carbolic acid, particularly, because of the danger of poisoning, should be avoided. Desquamation of the soles and palms is facilitated by prolonged soaking in hot water or hot soda solution, followed by rubbing with a coarse towel. One should not be over-zealous in hastening desquamation, as sometimes irritation of the skin is provoked thereby and the peeling process prolonged.

Cervical Adenitis.—For this condition cold compresses, the ice bag and rigid cleansing of the nasopharynx are to be employed. Sometimes hot poultices are more effective and agreeable. Fluctuation requires prompt incision and drainage, and resolution is encouraged by applications of ichthyol-lanolin (25 per cent.), the compound iodin ointment, or iodid of potassium in glycerin or lanolin (1 : 3 or 4), and by the internal administration of creosote and iodin, especially the iodid of iron.

Heart Complications.—In endocarditis, pericarditis and myocarditis rest, both cardiac and general, should be insisted upon. To secure this, absolute rest in bed, often for many weeks, together with the administration of opium, codein and bromids, is indispensable, supplemented with the local application of ice, hot poultices and sinapisms. Digitalis, strophanthus and strychnin are not often necessary. Strychnin may do good in myocarditis, but the use of digitalis in this form of heart affection has serious objections. Pleuritis should be treated as when it appears under other circumstances. As it is usually suppurative, the character of the fluid should be early determined by exploratory puncture that appropriate (surgical) treatment may be promptly instituted.

Gastrointestinal Symptoms.—The initial vomiting usually subsides spontaneously. If it persists, antiemetics, counterirritation to the epigastrium, and lavage, with regulation of the diet, will generally control it. Diarrhea, should it supervene, must be treated according to recognized principles.

Joint Affections.—The small proportion of so-called scarlatinal rheumatisms that are genuinely rheumatic, as indicated by the previous history and other symptoms, should be treated by the salicylates internally and locally; but this treatment is *not indicated,* and *is of no value,* in most of the joint affections encountered in scarlet fever. Rest, opium for excessive pain, cold or hot applications, immobilization of the affected joints, and surgical measures, should suppuration occur, are the proper methods for managing this complication.

Nephritis.—This, the most dreaded of all the complications and sequelæ of scarlatina, should always be in the mind of the practitioner. The physician who fails to examine daily, or very frequently, his patient's urine is not doing his full duty. By means of this measure the first indications of renal involvement may often be discovered before more definite symptoms have declared themselves. With the first trace of albumin in the urine the patient should be confined to bed; the bowels should be opened once or twice daily with salines, compound licorice powder, and other nonirritant cathartics; he should drink water moderately freely—preferably some mildly alkaline water; the diet should be limited to milk, but not in large amounts, and generally combined with cereals, carbohydrates and fruits; and the skin should be kept active by one or two warm baths daily, followed by friction and gentle massage. Care must be taken, however, not to regard the febrile albuminuria of the early stage as an evidence of nephritis. The measures just enumerated should also be followed, in the milder cases of genuine nephritis, with the exception that the diet in the early stages should be considerably restricted, so as not to overtax the eliminative powers of the crippled kidneys; the consumption of water diminished, if dropsy be present and the flow of urine scanty; and the amount of salt in the diet curtailed. Hot poultices and sinapisms over the kidneys are also advisable. No nephritic should be permitted to leave the bed, except in protracted cases, so long as the urine contains albumin, and for a week thereafter. For the same period the diet should remain meat-free, but in prolonged cases, and when the patient becomes anemic or loses weight, nitrogenous vegetables, and even meat, should be permitted. In the severe forms of nephritis, with fever, edema and scanty urine, more active treatment is demanded. Diaphoresis is indicated and may be induced by the warm bath (ten to fifteen minutes; 95°F., raised to 100°F.). Remember that the skin is sensitive; hence, the water should not be above 101°F. After the bath the patient must be enveloped in warm blankets and surrounded with hot-water bottles, or he may be wrapped in a blanket wrung out in water at 100°F. Over this a dry blanket and, finally, a rubber blanket are placed. In place of this hot dry (children do not stand hot dry air well) or hot moist air may be introduced under the bed clothes. If diaphoresis is not provoked by these measures, pilocarpin ($^1/_{20}$ grain, at five years) may be given hypodermically. I have never seen pulmonary edema from this drug; occasionally, some vomiting or salivation, but never untoward symptoms enough to prevent its use in urgent cases. Dry cups may be applied over the kidney, and the bowels should be freely opened with Rochelle or Epsom salts, or podophyllin ($^1/_{10}$ grain, at five years), or compound jalap powder (5 to 10 grains, at the same age). Calomel and elaterium, I believe, should be avoided. Care should be taken not to overdo catharsis; the patient must be treated as well as the disease. Suppression of urine calls for hot packs and saline solution by entero- or hypodermoclysis; and for high pulse tension nitroglycerin ($^1/_{300}$ grain every hour for five or six doses, or until an effect is produced). The use of diuretics in the early, or acute, stage of nephritis is, in my belief, decidedly open to objection and should not be practised. Cathartics and diaphoretics are more reliable; but, later on, diuretics are of benefit. Here the old acetate of potassium and infusion of digitalis mixture is useful; so, also, are spartein (¼ grain, at five years), diuretin (in 5 grain doses) caffein, and, in obdurate cases, the acet-theocin sodium (2 to 3 grains, thrice daily at four years). High, hot saline rectal injections (4 to 6 ounces every four to six hours) often act happily in provoking diuresis.

Uremic Convulsions.—Chloroform and chloral by rectum (10 grains at five years) should always be tried; but very frequently they will fail and morphin must be given ($^1/_{16}$ grain at two years;

$^1/_{12}$ grain at four years). Whenever I witness the brilliant effects of this drug I reproach myself for not having used it earlier. Although its use is difficult in young children, in urgent cases of coma and convulsions nothing acts so promptly as blood-letting. From a child of four, five, or six years 3 to 6 ounces of blood may be taken; and for the oft-resulting cardiac depression double the quantity of saline solution intravenously, or by hypodermoclysis, should be given.

Prophylaxis of Nephritis.—All schemes for the prevention of nephritis, at times, fail of their purpose. A strict milk diet will not prevent it; nor will urotropin, as claimed by Preisich, Thompson and others. Von Pirquet and Shick do not find this drug of any use in this respect; while Abt warns against its employment, because it is a genitourinary irritant. Pater, Dubour and others claim that under a salt-free dietary less nephritis occurs than when a strict milk regimen is adhered to; but until the relation of chloride retention to edema is more clearly understood it seems wise to adhere to the older methods. (To those who wish to try this method it may be mentioned that such a diet consists of milk, cream, eggs, bread, butter, potatoes, rice, sugar, green vegetables and fruits—all without salt.) On the whole, the prophylactic measures that have obtained the most support are a dietary of milk in moderate amounts, farinacea and fruits, and rest in bed for five or six weeks, even in the mildest cases.

Convalescence.—It is useless, Forchheimer remarks, to argue against the futility of the popular idea of "catching cold" after scarlet fever. To disarm criticism the patient should not be permitted to leave the room until at least six weeks from the onset of the attack, and longer when discharges from ear, nose or an empyema persist. Cases without eruption—those with throat and general symptoms only—should be isolated until the possibility of desquamation is passed, *i.e.*, about three weeks. In protracted cases, however, especially of nephritis, recovery will be promoted by gentle exercise, under suitable precautions, in the open air. The skin must be protected from chilling, iron and its compounds (especially the tincture of the chlorid of iron, Eisenzucker, ovoferrin and Basham's mixture) are to be administered, and the urine should occasionally be examined. Scarlet fever patients should not be permitted to sleep with children who have not had the disease until one to two months after full recovery.

Special Methods of Treatment.—Of these, of which there are a legion, only two will be mentioned:

(1) *Serum Treatment.*—So far, this method of treating scarlet fever is *sub judice.* Heubner considers Marmorek's serum of no value, while Aronsohn says that, as yet, there is no specific serum for scarlet fever. The best results seem to have been obtained from Moser's serum, but it is difficult and expensive to obtain in this country, and as difficult to make. It must be given in large doses (200 c.c.) in the first three days of the attack, and there is considerable danger of serum disease. Shick has used it in 200 cases, and is convinced of its specificity. It appears to have an effect on the infectious phenomena only, but not on the sequelæ; it does not prevent nephritis. By its use the mortality in the Vienna Children's Hospital was reduced from 14.05 to 8 per cent.

(2) *Treatment by Chloral Hydrate.*—This was first recommended by J. C. Wilson. B. F. Royer has made an extensive trial of this drug in 1,000 patients, and concludes that the claims made for it are warranted, viz., protection of the functionating part of the kidneys, alleviation of itching and increase of the patient's well-being. Sufficient is given to produce light and continued somnolence during the febrile period and for several days thereafter. This is accomplished by doses ranging from 1.875 to 3.75 grains every two to three hours.[*] Royer observed no depression and believes that nephritis is less frequent under its use. It is worthy of trial.

X-RAY TREATMENT OF SCALP.—McCleod (*The Lancet,* May 15, 1909) discusses the treatment of ringworm of the scalp by means of the X-ray. He believes that with the single-dosage method it is safe and harmless; that severe dermatitis followed by permanent baldness is due to over-exposure or accident, for which there is no excuse. He has been unable to find any definite evidence of injury to the brain by this method of treatment from his own cases or from the literature on the subject.—*Boston Medical and Surgical Journal.*

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[*] R, Chloral hydratis, gr. xxx; syr. lactucarii et aquæ āā ℥ ss vel ℥ i. Sig. dose ℥ i.

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CASEIN CURDS IN INFANTS' STOOLS.

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In the October, 1909, number of the ARCHIVES OF PEDIATRICS Ludwig F. Meyer and Jerome S. Leopold draw the following conclusions in an article on "The So-Called 'Casein Masses' in Infants' Stools":—

"(1) The so-called 'casein masses' cannot be considered as casein.

"(2) The nitrogen of the feces and the nitrogen of the food bear no intimate relation to one another.

"(3) The appearance of 'casein masses' and even an increased amount of N in the stools do not point to a disturbance in protein digestion."

Closer scrutiny of the evidence from which these conclusions are drawn shows that they are unwarranted.

The writers have apparently not discriminated between the two kinds of curds, but have evidently classed both the casein and the fat curds under the term of the "so-called casein masses." Herein lies the source of much confusion. It is true that the small, soft, white masses which look like milk remains are made up of fats, epithelial remains, etc., as Wiederhofer and Wegschieder have demonstrated. My own analyses, which appeared in the *Boston Medical and Surgical Journal,* January 7, 1909, confirmed their work. These analyses showed that the small soft curds were composed mainly of fat, the majority of which had been split into fatty acids and soaps, and that the percentage of nitrogen was low. They did not show any casein-like material under the microscope. The interpretation of these findings is that the fat given in the food is not completely utilized, and there is no more protein than in normal stools. The large, tough curds are of very different appearance, both physically and microscopically, and are of different chemical composition. Under the microscope they have the same tanslucent white appearance as artificial curds. My analyses (*Boston Medical and Surgical Journal,* June 11, 1908) agreed with the single analyses of both Knöpfelmacher and Selter. These two articles are the only ones that I am able to find in literature which describe and analyze quantitatively what I classify as a casein curd. My analyses show that in all these casein curds there is a high percentage of protein and that the percentage of fat varies with the amount of fat in the milk. The majority of this fat is in the form of neutral fat, which means that the digestive juices are not able to split the fat normally because it is surrounded by a casein envelope. Furthermore, curds made and digested artificially give exactly the same physical and chemical composition as natural curds. I was also able to dissolve and precipitate these tough curds, in the same way as casein, by weak alkaline and acid solutions. This precipitate was obtained in as pure a state as possible and found to contain nearly the same percentage of nitrogen as Hammersten's pure casein. (See composition of small curds, note No. 2.) The writers think that they have proved that these analyses are of no value by the following argument:—

"Langstein said, in answer to Selter, that the proteid played a rôle in the formation of these masses, but that this proteid could very well come from the intestinal secretion." Meyer and Leopold say that we are not justified in saying that these tough curds are casein simply because they give the protein reactions. This statement cannot be disputed because, as Adler has demonstrated, the heat, Biuret, Heller and other protein reactions are present in the feces which do not contain curds; on the other hand, this fact is *not evidence against* their casein origin. In my experience, I have *never* seen a tough curd in the stools of an infant taking a food free from casein.

The writers observed frequently in their clinic that "if we give whey to an infant, that is to say, food which contains neither casein or fat, we often see typical 'casein masses' in the stools," and they conclude, therefore, that these curds must come from the intestinal secretions. This conclusion is not warranted, because Schmidt and Strassburger (*Die Feces des Menschen,* p. 17) have shown that feces may remain in the Haustris coli a week before they are excreted, with fresh feces continually passing by. Improperly made whey may contain both casein and fat. The presence of casein curds, when whey is given as a food, can always be explained either by bowels that have not been completely evacuated, or by food which contains casein. These curds *always* disappear from the stools when the gastrointestinal tract is thoroughly cleared out with castor-oil and a food *free* from casein is given. They *never make their appearance* in the stools of infants taking a casein-free diet. It is, therefore, inconceivable that "this protein could very well come from the intestinal secretions."

A further argument which they used to prove that the tough curds are not composed of casein is Tobler's statement that "it is highly improbable that such a casein mass should pass through the whole intestinal tract undigested." Careful macroscopic and microscopic examinations of stools show that in certain pathologic conditions meat, potato and bread, in fact all the food components, can go through the entire intestinal canal partially or wholly undigested. There is nothing surprising, therefore, in the fact that casein curds may also pass through the intestinal tract undigested.

They quote Finkelstein to the effect that "large doses of casein may be given without bad effects." This statement must be modified before it is correct. The power of digestion is not completely developed at birth. Otherwise it would not have been necessary for nature to supply a food as easily digested as breast milk. For some reason the powers which regulate our existence did not see fit to give more than about 1½ per cent. of protein in this food. As the baby grows older digestion and assimilation become more developed, and at the end of the first half year* of life the gastrointestinal canal is able to take care of stronger and more varied food. During the second six months it is less difficult to feed a baby artificially than earlier; and it is fair to say that in general, after the sixth or seventh month, large doses of casein may be given to certain healthy babies without any bad effects. Finkelstein's statement would be correct if he said, "large doses of casein may be given without bad effects to most healthy babies in the second half year." This is not true, however, in the majority of young babies and especially those who are sick. I have seen many babies who were having their food regulated, or were convalescent from infectious diarrhea, fed on "fat free" milk, analyzing .2 to .5 per cent. fat (the whole milk from which this was obtained analyzed, protein: July, 1909, 2.98 per cent.; August, 3.02 per cent.; September, 3.02 per cent.), and most of them did well *at first*. When this treatment was persisted in they practically always began to show signs of casein indigestion after from ten to fourteen days. Tough curds appeared in their stools; they were distressed; they stopped gaining and often lost weight. When the food was weakened and a smaller amount of protein given it was necessary to replace the protein taken out with fat and sugar to maintain the caloric food needs of the infant. It was then found that neither the fat nor the casein could be digested; babies who were digesting fat before these large amounts of casein were given were unable to digest the same amounts of fat afterward. In other words, these young babies were able to respond to the demand for a short time and digest high percentages of casein, but their metabolism could not stand this high pressure, and when the machinery broke down they could not digest any of the food components. Overfeeding young babies with casein, therefore, may cause *both* a casein and a fat indigestion. The younger the baby the more likely is casein to upset him.

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* It is impossible to fix any arbitrary time at which large amounts of casein will be digested. The digestive powers of some babies are developed at a much earlier period than others. Some babies are developed so early that at three or four months they apparently digest food which is normal to a baby of six or even eight months.

The writers go on to say that their clinical observations have been confirmed by metabolism experiments. These experiments seem to show that casein is digested and used because it does not appear in the feces in the form of nitrogen. The same criticism holds here as with their clinical observations: the bodily activity is elastic enough to respond to increased demands and probably digest large amounts of casein for a short time. Older babies and some of the stronger young ones are well enough developed to digest relatively large amounts. There are others, however, who cannot digest these large amounts of casein. This failure to digest is more marked in babies who have been improperly fed or who are recovering from an infection of the intestinal canal. Furthermore, overfeeding with casein, as well as the other food components, may be instrumental in causing a fat indigestion.

A metabolism experiment of my own shows this very clearly, and also shows that it is easy to draw false inferences if too few observations are made.

McG., six and one-half months, had done perfectly well for a month preceding the experiment and was digesting its food normally. Previous to his entrance to the Hospital of the Massachusetts Infants' Asylum he had been fed improperly. During the first period of experiment, lasting three days, 21.816 grams of nitrogen were given in the food and .992 grams excreted in the feces. Three days later the second period of three days was commenced—22.585 grams N were given in the food and 2.131 grams excreted in the feces. In the third period, five days later, 8.074 grams N were given in the food and 1.928 grams excreted in the stools. Taken alone, these figures would lead one to the same conclusions as Meyer and Leopold. They would not be warranted, however, for although 83.5 grams of fat were well digested in the first period, and 13.9 grams in the second period, during the third period more than half the 41.825 grams of fat given in the food was excreted in the feces (23.576 grams). The stools of the third period were composed of many small soft curds, *i.e.*, fat curds, not casein curds. These results clearly indicate that casein can do harm.

Furthermore, Meyer and Leopold quote the case of an infant three months old that "was receiving 500 grams of buttermilk plus 5 per cent. 'Soxhlets Liebigzucher.'" This baby "showed the usual symptoms of dyspepsia (and an increased number of stools in which there were large and small 'casein masses')." When buttermilk is properly made all the casein is converted into lactate of casein, which will not form a curd with rennet. If buttermilk is improperly made and the casein is not entirely changed to the lactate of casein, casein curds may appear in the stools. I have known this to happen. It is fair to assume, therefore, that if casein curds appeared in these stools the buttermilk was improperly made. The writers then lowered the amount of sugar in the food and the casein curds disappeared. This may be explained on the one hand by the fact that the buttermilk was at that time completely ripened; or by the fact that taking the sugar from the food so changed the bacterial flora that the harmful bacteria, which were causing the indigestion, were routed out by a harmless species. The writers have evidently not considered the rôle which the intestinal flora plays in gastrointestinal diseases. I will not go further into this complicated phase of the subject than to say that under certain conditions bacteria probably have a marked influence on digestion, and that an overgrowth of harmful bacteria may lower the power of digesting any or all of the food components.

In conclusion, the conclusions of Meyer and Leopold are unwarranted and the evidence presented by them does not disprove the casein origin of tough curds. Furthermore, there is sufficient clinical and scientific evidence to prove that tough curds are composed principally of casein; that they are due to the imperfect digestion of casein, and that an excess of casein in the food may result in a fat as well as a casein indigestion.

Tubercle Bacilli in Milk.—A. F. Hess (*Journal American Medical Association,* March 27, 1909) examined samples taken from the large 40-quart cans which constitute a large proportion of the New York City milk supply and are often the same as the bottled milk. In 107 samples 17 or 16 per cent. were found, by inoculation tests on guinea pigs, to be tuberculous, tubercle bacilli being found in the guinea pig on autopsy. Tubercle bacilli were not discovered by direct microscopic examination, but only by animal inoculation; cream, as well as sediment, was found infective. Tubercle bacilli were also detected in a sample of "commercially pasteurized" milk, claimed to have been heated to 160° F. for forty seconds, showing that this name is misleading and suggesting that only such milk be called "pasteurized" as has been heated for a length of time and to a degree sufficient to insure its being a safe food. In all but one instance the bacilli found were of the bovine type. In the exceptional case a human type was found, showing that human contamination of milk is possible and must be guarded against. A number of infants and young children who drank milk containing tubercle bacilli, when examined one year later, seemed in average health. A fourth of the number, however, reacted to tuberculin. One of them was in poor physical condition and had suffered from a recent glandular affection. Probably 90 per cent. of human tuberculosis is due to infection from human beings, but we are not, therefore, justified in neglecting the danger from the bovine source, as even a very small percentage from this cause means thousands of cases. As an immediate safeguard, Hess recommends pasteurizing or boiling all milk not coming from tuberculin-tested cows. There should be a great many more inspectors of herds and finally all cows should be tested with tuberculin, and, if found reacting, should be condemned or isolated.—*Medical Record.*

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SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS.

Stated Meeting, November 11, 1909.

DR. ELI LONG, CHAIRMAN.

TWO CASES OF CEREBRAL DIPLEGIA.

DR. MATTHIAS NICOLL, JR., presented a boy, three years old, and a girl, six years old, with this affection.

DR. WILLIAM P. NORTHRUP said that the second case presented by Dr. Nicoll he had lectured on for three years in his clinic. During that time he had not been able to help her very much. He was glad to note some improvement in her condition now. This was one of the most pathetic cases he had ever known. The improvement had been so very little and there seemed to be no encouragement to offer and the child strived so hard to use her limbs. Now he believed she had ceased to improve. He concurred in the diagnosis made, but he could see no future for the child.

DR. REGINALD H. SAYRE said that in a good many of these spastic cases it seemed to him improvement would follow stretching the legs and keeping them stretched for a good part of the day; overstretch the contracted muscles so that the anterior skin group, and the extensors of the thigh could act without undue opposition. Systematically teaching such patients how to balance and stand resulted favorably. He had seen many patients make good progress; they could get around without assistance, without handling anything, getting around without any support. He believed that such children could be greatly benefited by stretching these contracted muscles and teaching them to coördinate their movements. Mrs. Seguin, of Orange, got marvellous improvements in cases with spastic conditions. In this case the calf muscles were so contracted the patient could not put the heel to the floor. Dr. Sayre thought by stretching these muscles the heel could be placed upon the floor and the patient enabled to hold her balance better than she now did. In the present case tenotomy probably would not be necessary. The coördination of movements was to be taught by exercises very similar to those used by Fraenkel in cases of locomotor ataxia.

A CASE OF EXTENSIVE PARALYSIS DUE TO ANTERIOR POLIOMYELITIS.

Dr. Oscar M. Schloss presented this patient for Dr. Rowland G. Freeman. This was a case of anterior poliomyelitis with extensive paralysis, which involved the thoracic respiratory muscles. When admitted to the clinic the child could move the hands and feet, but otherwise the extremities were powerless. The respirations were entirely diaphragmatic, and the anterior neck muscles were paralyzed. None of the reflexes could be obtained in the arms. Sensation seemed to be intact. During the three weeks the child had been under observation there had been a noticeable improvement.

CASES OF PARALYSIS OF THE THORACIC MUSCLES.

Dr. Pease presented 3 such cases for Dr. Henry Dwight Chapin. The paralysis resulted from anterior poliomyelitis.

Dr. William P. Northrup, speaking of complete paralysis of the thoracic muscles, the work of respiration being done by the diaphragm, said that he had seen probably 4 or 5 such cases in his life. The first case presented by Dr. Schloss for Dr. Chapin come to his clinic at the Bellevue Medical College, and he asked those present to examine it carefully. He recalled a case seen last week in the accident ward of the Presbyterian Hospital, in which the coroner found the sixth cervical vertebra had been driven in, mashing the spinal cord to a pulp.

Dr. Northrup presented some photographs taken of 3 cases of paralysis of the abdominal wall due to anterior poliomyelitis.

Dr. Henry W. Frauenthal presented seven photographs of children with hernia, or bulging through the abdominal wall, similar to the cases shown by Dr. Northrup. He presented a case similar to Dr. Chapin's, with paralysis and atrophy of the thoracic muscles. This patient had all the muscles of the extremities and trunk involved. The diaphragm was still involved. Under massage, high frequency and sinusoidal electricity he finally regained perfect use of his legs and left arm. The right arm was still involved. The pectoralis major and minor muscles, together with the other muscles of respiration, have not as yet responded to the treatment; hence the appearance of the chest and his abdominal breathing.

THE NEW TREATMENT OF SPASTIC PARALYSIS BY RESECTION OF POSTERIOR SPINAL NERVE ROOTS.

DR. L. PIERCE CLARK and DR. ALFRED S. TAYLOR presented this communication. There was a twofold motor disturbance in the extremities as a result of damage or destruction of the superior pyramidal tracts, namely, contraction and weakness of various muscles. The character and completeness of the injury of the pyramidal tracts gave the peculiar type of contraction and paresis of the different muscles in the several types of spasticities. Complete hemiplegia as the result of total destruction of all of the pyramidal tract of the opposite side was rare. As a rule, hemiplegia underwent some degree of spontaneous cure, but whole series of movements could be performed only with incompleteness and difficulty. When the pathway of excitability of muscles from the cortex by way of the pyramidal tracts was destroyed or severely damaged, the irritability of the muscles from the periphery, as the result of sensory impressions was not only preserved, but was more or less heightened. The pyramidal path also inhibited the lower spinal reflex, and in the lessened control permitted an insubordinate activity of the lower spinal centres. The objective evidence of the enhanced reflex irritability in the lower arc was shown in the spastic syndrome of increased knee jerk, ankle clonus, Babinski reflex, etc. As a rule, the greater the absence of voluntary motion, the greater the reflex activity. Aside from the involuntary associated movements in the diplegics, they had a more or less late, but permanent, spastic muscular contracture, which did not disappear on ether narcosis. These contractures prevented motor functions by offering more or less resistance to extension. The inhibiting function of the pyramidal tracts was independent throughout of the function producing spasticity. When the seat of entry of the posterior or sensory roots were diseased, as in tabes, the reflexes were abolished. Many surgical procedures had been undertaken to restore the normal balance in the spinal reflex arc in deplegics. In a review of the different plans of surgical relief for these motor defects one was struck at once with the almost unanimous point of attack to which surgeons had heretofore addressed themselves; they had endeavored to reduce the excess of motor pull on the spastic muscles by reducing some part of the motor apparatus. It was frequently admitted that the degree of muscle tone in an extremity was determined by the sensory impression from the parts and especially from the muscles. Tonic spasm might, therefore, be regarded as an augmented degree of this state due to various causes. The motor part of the reflex arc was obviously beyond attack, for while the contraction would be temporarily relieved, a complete palsy of the muscles involved would result. Neurectomy in the peripheral nerves proper could not be employed, as these consist alike of sensory and motor nerves. The posterior sensory roots were the points of attack if one sought the sensory side of the arc. Just what part and how much of the sensory stimuli might be removed to gain the desired end, flaccidity, was even yet not clear. The best point of attack on these sensory nerves was in the spinal canal, dorsal to their ganglion. Dr. Taylor, therefore, operated at this point. The work of Forster and Tietze and Gottstein was then briefly summarized.

The first case presented was a boy eleven years old, whose history was negative, except a cerebral diplegia secondary to meningoencephalitis induced by a very severe attack of malignant scarlet fever at eleven months of age. The boy's paraplegic syndrome was typical. With his spastic handicap the boy was able to walk by very short steps without assistance, but with arms extended. Various orthopedic measures failed to materially help him. Inasmuch as they had at that time no positive guide regarding the amount of resection necessary the dorsal roots of but one side, the left, were resected. They were the last dorsal and five lumbar. The operation was performed August 23, 1909. On the fifth day after the operation the patient was entirely free from pain. One week after examination there was a greatly reduced spasticity in the whole left leg, there was a great reduction in the reflexes, there was absence of ankle clonus and an imperfect production of the Babinski. The crossed leg progression was succeeded by quite a straddling-skating gait. The patient now stood and walked alone. Later further operation would be undertaken.

The second case was an eighteen-year-old boy who had suffered from left hemiplegia from birth. The typical infantile hemiplegic syndrome developed, the arm and leg were moderately underdeveloped, the left forearm was contracted on the arm at an acute angle, and the hand was flexed at more than a right angle at the wrist. The fingers were in extension and could just be moved. The whole extremity was in a "birdwing" contracture and spastic. The patient was feeble-minded. Three days ago Dr. Taylor resected the dorsal nerve roots from the fourth cervical to the second dorsal inclusive. A rough examination of the patient two days after operation showed anesthesia in the lower two-thirds of the whole length of the arm. The arm was entirely free from spacticity. Tenotomy, physical training and orthopedic appliances will be employed.

THE SURGICAL TECHNIC.

Dr. Alfred S. Taylor stated that the technic in resection of the posterior spinal nerve roots differed somewhat from that of an ordinary laminectomy; in the latter they removed the spinous processes and more or less of the laminæ of both sides. Tietze had complained that there was great difficulty after doing a laminectomy in exposing the posterior roots of the spinal nerves. In doing an ordinary laminectomy the portions removed were near the median line. It occurred to Dr. Taylor that if he could get sufficient room through a unilateral exposure, he would not only come directly down upon the nerve roots but would leave the spines intact, and this would be a very efficient operative procedure.

The operation consisted in making a longitudinal incision just to one side of the spinous processes; the muscles were separated from the spinous processes and were retracted from the laminæ themselves outward to the articular processes of the vertebræ. Then, by means of a Doyen saw, he sawed through the lamina at the base of the spinous process and also near the articular process. One might get from one-quarter to one-half an inch of room by cutting outward toward the articular processes. After making a double line of sections, the parts could be lifted and removed by means of bone forceps. To get under the remaining laminæ he used the rongeur forceps, leaving a clean cut entrance between the bones, thus coming down upon the dura. Then the highly vascular layer of fat was divided, and whatever hemorrhage occurred here was readily controlled by pressure. The dura was exposed and slit longitudinally, fully exposing the spinal cord.

Dr. Taylor had made many dissections. He showed pictures of spines in which laminectomy was performed, showing well the exposure he obtained. One picture showed the conditions before, the other after opening the dura mater. One-half the lumbar enlargement, as well as one-half the cauda equina, was clearly visible. The lower cord itself could be readily turned 90 degrees wthout injury to the lumbar enlargement.

It seemed to Dr. Taylor that this method was adaptable for exposing tumors of the spinal cord. After an ordinary laminectomy there resulted a marked deformity of the back, and a part of the cord was not protected by bone.

Demonstration of a Case after Limited Resection.—Dr. Alfred S. Taylor presented this patient. In operating upon this boy he worked through a groove about three-eighths of an inch wide. There was at present no loss of function in the spine. The spine was flexible laterally and antero-posteriorly.

Exhibition of Cases Suitable for Operation.—Dr. Alfred S. Taylor presented 2 cases upon whom he intended to operate, one being a case of infantile cerebral diplegia and an epileptic as well.

Dr. Charles Ogilvy said he had previously seen the patient presented by Dr. Taylor when he had been unable to walk without a shuffling gait; he then had great difficulty in raising the feet from the floor. The spasticity was then more marked than it was at present. He believed it was very difficult to describe in so many words improvement in a case of this kind as it was more of an improvement of the conditions than a cure of them. Dr. Ogilvy intended to have the patient walk with braces and crutches; in fact he had been measured for braces.

The second case, presented by Drs. Clark and Taylor, showed very marked contractures. These were still present after the operation, but without doubt these contractures could be improved.

The exposure made of the cord by Dr. Taylor was certainly beautiful, and the hemorrhage was much less than one had in doing an ordinary bilateral laminectomy. The patients did remarkably well. Both patients had done splendidly. The second case was practically well the day after the operation.

Dr. Joseph Fraenkel congratulated Dr. Clark and Dr. Taylor upon the results they had obtained in the cases presented.

In order to understand the rationale of this mode of treatment of spastic paralyses, it would be necessary to say a few words about the diagnostic and prognostic interpretations of the reflexes.

The speaker has been interested in the subject for a good many years, and about ten years ago made a study of the relationship of the tonus of the tendons to the reflex phenomena. Among the conclusions reached in this study the one having particular reference to the subject in question to-night reads:

"That disease of the pyramidal tracts causes hypertonia and increase of reflexes. The tendon jerks under such conditions are increased unless additional disease of the ascending tracts, anterior horns, or some part of the peripheral neurons neutralizes this influence."

The loss of motor function in spastic conditions is, as thorough clinical analysis shows, in direct proportion to the reflex spasticity. It appeared then rational to add sensory disease wherever the loss of motor function was considerable.

Dr. Beer, at the suggestion of the speaker, tried the influence of stovain injections into the nerve or cerebrospinal fluid. The immediate results obtained were quite convincing, in the shape of marked return of motion, disappearance of spasms and disappearance of ankle clonus and Babinsky signs.

These beneficial results lasted of course as long as the influence of the stovainisation, and with the disappearance of the anesthesia thus produced the spastic phenomena became re-established.

The speaker was glad to hear that the experiments on the living and the work done by Foerster gave further corroboration of the correctness of this therapeutic procedure.

It will, however, be necessary to be very careful in the selection of cases adopted for this mode of interference.

First of all, it appears that cases of extreme spastic contractures will derive benefit from posterior nerve cutting by having their inordinately stiff, useless extremities changed into more or less flaccid ones.

Concerning the operative technic, the speaker would like to emphasize the fact that the severance has to be made so that the intervertebral ganglion be left in connection with the peripheral stump.

Dr. Virgil P. Gibney said that so far as the operation itself was concerned, they were waiting to see results, which promised at present to be favorable. He had never seen a case of spasticity overcome, although he had seen improvement in some cases. He had divided the hamstring muscles, the tendo Achilles, the adductors of the thigh, and had even removed *en masse* the tensor vagina femoræ to get rid of the spasticity. The correction lasted for months, sometimes even for years, and he hoped the spasticity was overcome; but it would creep back on him, and at last he became skeptical about ever being able to finally abolish it.

Dr. Gibney complimented the work of Dr. Clark and Dr. Taylor.

DR. EDWARD D. FISHER said that the operation was one that was likely to produce temporary paralysis, but even that might be better than the spasticity, especially in the more severe cases. There was a proper physiological basis for this operation. Two things had been accomplished, muscular flaccidity and the removal of irritating impulses to the brain.

Therefore, the value of the operation was a double one; it had a double value. It first reduced the spasticity and might also improve the cortical condition, not by regenerating the cells, but by removing the source of irritation and giving them a rest. It might then have an influence in reducing the tendency to epileptic seizures.

The selection of appropriate cases was very important; those in which there was the least mental impairment would prove the most successful.

DR. T. HALSTED MYERS said that in the severer contractures one must decide whether there was a permanent muscular change or whether the deformity was due to the spastic condition itself. If there were structural changes in the muscles, he thought operation was very well indicated, and should be the first step taken, making full division of the tendons and muscles. If good did not result, he thought then, from a description of the operation, that it might help.

DR. SAMUEL LLOYD said he was very much interested in the work previously done along the line of section of the posterior nerve roots. In this work there was to be considered the question of regeneration, and just how much that would bring back the spastic condition of the patient at a later date. The operation might give a cortical rest and, in that way, it might cause an improvement in the spasticity. Dr. Lloyd also discussed in detail the operation and technic.

DR. L. PIERCE CLARK and DR. ALFRED TAYLOR closed the discussion. Dr. Clark said that they must remember that the resection of the dorsal nerve roots was done *dorsal* to the sensory nerve ganglion, and that this point of resection insured absolutely no regeneration of the nerve or return of the former spastic element. Furthermore, the ganglion being upon the peripheral portion, equally insured against the supervention of trophic changes in the peripheral structures. The work was to continue on a large series of cases, and scientific reports would be issued from time to time.

DR. ALFRED S. TAYLOR, in closing, expressed his appreciation of the discussion, which had suggested much of value for future work.

Concerning the technic, he wished again to call attention to the fact that Tietze had complained of the unsatisfactory approach to the posterior roots by means of the usual bilateral laminectomy; whereas his own (Taylor's) method brought the operator directly down upon the roots sought, and the roots of the opposite side could be divided if necessary through the same incision.

Replying to the remarks in favor of bilateral laminectomy, he stated that the method which gave the most convenient exposure with the least loss of bony structure was certainly to be preferred, and that unilateral laminectomy fulfilled these conditions.

BORDET'S WHOOPING-COUGH BACILLUS.—G. Seiffert (*Münch. Med. Woch.,* January 19, 1909) has experimented on the action of the bacillus of whooping-cough discovered by Bordet. Sixteen specimens of sputum from cases of pertussis were tested. Of these, in 12 the bacillus was found in pure culture. Four cases were negative, of which 2 were in elderly women who had the disease some time before, and 2 were children. All the positive sputa came from sick children. Each specimen was cultivated and tested by agglutination with immune horse serum produced by Bordet. Agglutination was strongly evident in a dilution of 1:1,000. Six sera gave marked agglutination at 1:16, slight at 1:32. Two failed to agglutinate at all. Influenza bacilli were not agglutinated by pertussis serum. This bacillus disappears with the disappearance of the disease.—*American Journal of Obstetrics.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, November 9, 1909.

SYMPOSIUM ON SCARLET FEVER.*

DISCUSSION.

Dr. W. M. Welch said that the period of incubation of scarlet fever, while usually short, may be variable. He believed that in the majority of cases this period is four or five days; from three to seven days will cover most cases. The specific cause of the disease remains unknown. The susceptibility in individuals varies not infrequently. He cited the instance of a nurse who had been on duty in the scarlet fever wards for about three months and was considered immune, left the hospital and was absent a year. On her return to duty in the scarlet fever ward she contracted the disease in a severe form. He stated that the disease is most frequent in young children and is also most fatal among them. Many persons appear to be naturally immune. While as many as four-fifths of the students who annually visit the Municipal Hospital for clinical instruction have never had scarlet fever, only one case has developed among them in the past ten years. The onset is sudden. Sore throat is the earliest symptom and this is rarely absent. The rash makes its appearance in from six to twenty-four hours from the beginning of illness. It prefers the trunk and extremities; frequently it is absent on the face. But whether the face be involved or not, it almost always presents an appearance that is peculiar, circumoral pallor with intensely red lips. The eruption is diffuse and punctiform; frequent miliary vesicles are seen on parts where the rash is intense. Stroking the skin of the trunk and extremities will cause pale lines to appear. These will rapidly disappear by return of the capillary circulation, but in a few moments the pale lines reappear and continue for some time. This is commonly called secondary pallor. The appearance of the tongue is undoubtedly of much importance. At first it is covered with a creamy-white coating, while its edges and tip are of bright-red color and the papillæ very prominent. On the third day the coating will be seen to have disappeared to great extent, and on the fourth day its disappearance is usually complete, leaving the upper surface of the tongue very red and the papillæ very prominent. We now have the strawberry tongue well marked. He regards the form of desquamation which begins at the free margins of the finger nails and strips backward, leaving the ends of the fingers of a pink color, as most characteristic. Dr. Welch confesses that he is unable to say when a person who has recovered from scarlet fever is free from danger of spreading the disease. He has known such persons to communicate the contagion for as late a period as four months from the beginning of the illness, and long after all evidence of desquamation had disappeared. He is unable to state positively that the exfoliating particles of the epidermis are not infectious, but he firmly believes that the discharges from the nose, throats and ears are infectious and that they may continue so for a long time. In speaking of treatment he favored the use of chloral hydrate where there is delirium with insomnia and restlessness. In scarlatinal nephritis he highly recommends infusion of digitalis with acetate of potash. Should the urine continue scanty, recourse should be had to copious sweating by means of the hot pack.

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* For papers see pp. 880, 889, 894, 902 and 909.

Dr. B. H. Potts said that a very considerable percentage of his patients give a direct scarlet fever history. This is true not only of suppurative cases, but also of many patients who suffer from increasing deafness without history of any ear discharge, though there may have been discharge, with membrane rupture, without the patient's knowledge, the scar on the membrane giving indisputable evidence of the process. Otitis media is the most common and the most dangerous complication of scarlet fever, on account of the possibility of grave septic conditions resulting. Function is nearly always impaired and frequently destroyed. The streptococcus is the microörganism most frequently present in discharges from the ear. Dr. Potts divides cases of scarlatinal otitis into three classes, occurring at different stages of the general infection. The first is acute serous inflammation developing before the eruption, mild in form, with few symptoms and a serous discharge, which may later become infected. The second class, acute suppurative otitis, generally begins about the second week of the illness, with a rise in temperature, pain and adenitis. The third class is the necrotic type, very severe in character. Dr. Potts believes that infection occurs sometimes through the Eustachian tube and sometimes through the blood and lymphatics. Prognosis should be guarded. Patients with enlarged tonsils and adenoids are apt to suffer severely and to have continued discharge. Treatment is surgical and antiseptic. There is unquestionably a contagious element in the discharge of a scarlatinal otitis and great care should be exercised in the antiseptic cleansing of the ear. The discharge should be considered a factor in quarantine. Early recognition and prompt treatment of ear complications will certainly save your patient trouble and distress and may save a life.

Dr. E. E. Graham said that scarlet fever is not very contagious during the first twenty-four hours. This is proven by the fact that children isolated promptly at the end of the first twenty-four hours very often do not contract the disease. This is probably due to the fact that contagion is not spread by the breath, and during the first twenty-four hours there is not so much membrane and discharge from the various mucous membranes. There is, of course, no desquamation and there is probably little, if any, infection of urine, feces or perspiration; or if there is such infection, it is probably less than later in the disease. Too much stress cannot be laid on the importance of isolating cases of scarlet fever as long as there is any purulent otitis, rhinitis, pharyngitis or suppuration of the glands. All children, before admission to a hospital, should be carefully examined to ascertain if any such condition, should it be found, might not be a sequel to scarlet fever. The discharge of postscarlatinal empyema is also positively capable of transmitting the disease. A scarlatiniform rash alone is not scarlet fever, for digestive disturbances in infants not uncommonly produce an erythema closely simulating scarlet fever, as also may result from antipyrin, quinin and belladonna. Sore throat with rash should always suggest scarlet fever. The temperature chart is important in diagnosing complications. Dr. Graham advanced several arguments against the streptococcus being the cause of scarlet fever. He also advocates nasal douching in the treatment of scarlet fever.

Dr. F. C. Knowles emphasized the resemblance between certain drug eruptions and scarlet fever, particularly in regard to quinin. Several cases of this character had been observed. Two years ago he saw a patient in Dr. Davis' service at the Pennsylvania Hospital, in whom several days elapsed before the diagnosis of quinin dermatitis could be made positively. Recently a patient under treatment for exfoliation of the palms of the hands and fingers, resembling markedly that found in scarlet fever, was found to be due to packing quinin pills in boxes and bottles. Several cases of exfoliation of the hands associated with sweating have been observed, of the type mentioned by Dr. Schamberg in his paper and previously reported by him in the *Journal of the American Medical Association.*

Dr. J. T. Rugh spoke of the joint manifestations of scarlet fever. They may result from the toxins elaborated or from the direct infection of the joint with the streptococcus. Surgical intervention should be used very early in those cases due to direct infection to save the joint function if possible, and often to save life, as these inflammations are extremely violent.

Dr. Miller remarked that nothing had been said in reference to the duration of quarantine in cases with the enanthem alone, as Forchheimer calls those occasional cases with throat and general symptoms, but without eruption. Dr. Miller thought such cases should be isolated until the possibility of desquamation had passed, two or three weeks.

Dr. Schamberg added that there was no positive evidence of the infectiousness of desquamating epithelium in scarlet fever, and there was considerable negative evidence against the view generally held. The majority of physicians of large experience no longer hold to the traditional view on this subject. Despite this, the establishing of the cessation of desquamation as the minimum boundary of the isolation period was not a bad working rule. The real lurking places of the germs are doubtless the nose, throat and ears.

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. T. WOOD CLARKE.
DR. R. S. HAYNES.
DR. A. F. HESS.
DR. C. D. MARTINETTI.
DR. CHARLES OGLIVY.
DR. M. C. PEASE, JR.
DR. G. R. PISEK.

PATHOLOGY.

KRAUSE, P., AND MEINICKE, E.: THE ETIOLOGY OF ACUTE EPIDEMIC INFANTILE PARALYSIS. (*Deutsch. Med. Woch.*, No. 42, 1909.)

This article gives, in synopsis, an account of a thorough study of this disease by Krause, who is well known for his work on the dysentery bacillus. The results were not great, but the investigation brought out many negative points of value to other workers in this field. An examination of the fluids and excretions of the body showed no microorganism or other parasite; this was likewise true of cultures made at autopsy. Inoculation of brain or spinal cord into the various laboratory animals, including apes and chickens, produced no result except in one particular. It was found that when such material was inoculated subdurally, intravenously, or intraperitoneally into rabbits, rapid death ensued, accompanied by symptoms referable to the central nervous system. This, the authors state, is the first report of a positive inoculation into animals, and, from this point of view, is of interest, and, perhaps, of importance. ALFRED F. HESS.

ZAMBONI, GIUSEPPE: ANATOMY OF INFANTILE SPLENIC ANEMIA. (*Riv. di Clinica Ped.*, October, 1909.)

Zamboni draws the following conclusions from his researches on the anatomy and pathology of infantile splenic anemia:

(*a*) The most frequent and evident alterations are found in the spleen; then follow in order those affecting liver, bone-marrow and lymphatic glands. Splenic lesions are primary; the others secondary. The duration and severity of the attack produce some variations.

(*b*) The spleen generally is enlarged in all its component tissues; the capsule is affected by sclerosis; frequently there are evident hemorrhages.

(*c*) The liver is edematous, congested, or may show signs of fatty degeneration. Rarely is the connective tissue hypertrophied.

(*d*) The bone-marrow is often increased or decreased in volume. Its elements are unaltered except in number. Its condition would appear to affect the duration of the disease.

(*e*) Lymphatic glands may be normal or simply hyperplastic. Their alterations seem chiefly due to concomitant ailments. C. D. MARTINETTI.

NOGUCHI, HYDEYO: COMPLEMENT FIXATION TEST IN THE DIAGNOSIS OF SYPHILITIC AND METASYPHILITIC CONDITIONS. (*The Archives of Diagnosis,* July, 1909, p. 229.)

According to Dr. Noguchi, the majority of investigators who have used the Wasserman reaction are of the opinion that it has a very great value in the diagnosis of syphilitic and metasyphilitic conditions. The test in its original form was too complicated for the ordinary investigator, and too open to errors on account of the instability of the necessary reagents; and hence there have been suggested a number of modifications which are intended as improvements of the original technic. The writer gives many reasons to make us believe that his modification is to be preferred to others, but as the details of his method are hardly more than suggested, it seems wise to withhold an opinion in the matter until there is a full and exhaustive presentation of the complement fixation test and the butyric acid test by the author in a monograph soon to be published. M. C. PEASE, JR.

BAUER, J.: THE BIOLOGY OF COLOSTRUM. (*Deutsch. Med. Woch.,* 1909, No. 38, p. 1,657.)

While many investigations as to the difference between milk and colostrum have been made by physiologists and chemists, but little has been done by the biologists. Albumins from various sources may be differentiated by hemolytic reactions. The albumin of milk acts differently from that of the blood serum of the animal giving the milk. The hemolytic reactions of colostrum differ markedly from those of the milk of the same animal, but cannot be distinguished from those of the blood serum. From this it would appear that whereas the proteins of milk are manufactured in the mammary glands, those of the colostrum are obtained by direct transudation from the blood.

T. WOOD CLARKE.

FRIBERGER, RAGNER: STUDIES OF THE SOCALLED SALT FEVER AND CHLORID EXCRETION OF INFANTS. (*Muench. Med. Woch.*, No. 38, 1909, p. 1,946.)

Attempts to confirm the finding of Meyer and Rietschl that the injection of sodium chlorid or its administration by mouth produces a fever in infants were only partially successful in that whereas the previous workers got results with regularity, in these experiments they could be obtained in only about one-half of the cases. Distinctly more salt must be given by mouth than hypodermically to produce the results. Metabolic investigations teach nothing in these cases. The salt is excreted more rapidly when administered by mouth than when given under the skin. Examination of a section of skin, six hours after the injection of saline solution, shows a collection of lymphocytes and other cells. It is therefore possible that the socalled salt fever is merely the result of trauma and mechanical tissue injury produced by the injection and not due to any specific action of the salt on the organism. Certain points, however, suggest that this is not the case. Further study is required.

T. WOOD CLARKE.

SURGERY.

MACKENZIE, A. J. FRACTURE OF THE LONG BONES IN INFANTS. (*The Canada Lancet*, June, 1909, p. 741.)

Fractures of the long bones in infants may be divided into those occurring in utero, during parturition, and after parturition, and the characteristics of all occurring in the first year will be much alike, *i.e.*, until the child walks.

Fractures in utero may be due to external violence to the mother, to violent uterine contractions, or even to violent muscular action on the part of the fetus. Fractures during parturition may be due to causes in the bones themselves, but much more commonly as a consequence of violence applied for the purpose of delivery. Injuries in the first year may be due to direct violence, as from falls; and syphilis, scrofula or, according to some, rickets.

None of these fractures present any difficulties, with the possible exception of the femur. They sometimes unite spontaneously, and there is always a deposition of a great deal of callus. There should be care in nursing, and splints should be applied which will keep the ends in apposition and bring about immobilization. If successful two or three weeks will suffice for a cure and the callus will quickly disappear. The requisites as laid down for an apparatus for the fracture of the femur by Stern (*New York Medical Journal,* May 20, 1905) may be quoted as applying here: (1) Ability to nurse; (2) cleanliness; (3) ability to hold fragments in apposition without deformity; (4) freedom from pain on moving child for necessary changes of clothing; (5) ability to prevent shortening.

The method of treatment of the fractured femur which meets these indications most completely is the socalled Schede's method of vertical suspension. The suspension should be just sufficient to raise the hips of the child off the bed. The child is nursed by the mother lying at the edge of the bed.

M. C. PEASE, JR.

ORTHOPEDIC SURGERY.

HORNUNG: A NEW BLOODLESS METHOD OF TREATING SYNDACTYLISM IN THE NEWBORN. (*Zeitschr. für Orthop. Chirurg.,* Bd. XX., S. 292.)

The objection to an operative procedure is the difficulty of obtaining sufficient skin to cover the exposed surfaces and the danger of recurrent growth of the margins of the wounds.

Spitzy has invented a small apparatus, which Hornung describes. It consists of two three-sided prisms, which by means of two screw spindles can approach one another up to the contact of two longitudinal edges. The screws are fixed tightly on one prism and on their ends are sharp points. The one screw is thrust through at the base of the finger to be separated. The other comes to lie at the finger tip. Through gradual tightening of the screws the skin lying between is attenuated. A necrosis of the skin through too rapid pressure is to be avoided.

C. OGILVY.

AXHAUSEN: HISTOLOGIC EXAMINATIONS OF TRANSPLANTED BONES. (*Deutsch. Zeitschr. für Chirurg.*, 91, Bd. H. 3-4, p. 385.)

Contrary to the well-known opinion of Bartho, regarding the fate of transplanted bones, Axhausen finds in a case from Kieler's clinic, in which the result of a careful histologic examination is given, that the engrafted periosteum in apposition to bony tissue does not die. The substitution of the dead bone ensues through new formation from the grafted periosteum, which is capable of function. The grafting of fresh bone covered with periosteum is therefore recommended. C. OGILVY.

MEDICINE.

DORAN, W. T.: A CASE OF MELENA—RECOVERY. (*Interstate Medical Journal,* July, 1909, p. 495.)

The author reports a very interesting case of melena with recovery. The child at birth weighed five pounds and fifteen ounces, and seemed to be normal in every way. The second day it vomited a little blood, and on the following morning passed blood in the stool. The mucous membrane of the mouth and nose oozed blood, of a bright red color. During the next five days this continued, with a variable temperature, which rose at times as high as 104.8° F. and with a constant loss of weight to four pounds, eleven ounces. The child became so weak as not to be able to nurse. Urine normal. At no time was there any signs of infection of the navel. The treatment consisted of lavage and the administration through the tube of two grains of calcium lactate in hot water; adrenalin chlorid by mouth, five drops; peptonized cow's milk with three grains calcium lactate by rectum. On the fifth day peptonized mother's milk was substituted for the cow's milk, and given both by mouth and by rectum. The adrenalin chlorid and calcium lactate were continued as before. The child gained; the blood gradually disappeared from the stomach and stool. On the seventh day the baby could nurse.

M. C. PEASE, JR.

ACQUADERNI, A., AND LORENZINI, A.: FECAL INCONTINENCE. (*Riv. di Clin. Ped.*, May, 1909.)

The authors give at length the history of two children, aged eight and twelve, in whom fecal incontinence had always been present to a marked degree. Their conclusion on the subject would appear to demonstrate that the patients merely lacked voluntary inhibition. Treatment by suggestion in both cases was rewarded with complete success. C. D. MARTINETTI.

WILLIAMS, LEONARD: ADENOIDS AND NOCTURNAL ENURESIS. (*British Journal of Children's Diseases,* June, 1909.)

This article gives a brief résumé of the conclusions reached in an earlier article on the same subject (see ARCHIVES, September, 1909, p. 717) and then treats at length some of the more obscure signs of thyroid insufficiency which have been noted in the course of Williams's experiments in the treatment of enuresis by thyroid extract.

Adenoids and enuresis are associated only because they are due to an underlying cause, namely, thyroid insufficiency. Williams believes that some of the signs attributed to the blocking of the air passages by adenoids may be due rather to the cause of the adenoids.

The majority of the cases of enuresis observed had a subnormal temperature, which gradually became normal with the thyroid treatment and the cessation of the enuresis. The solitary case of complete failure of enuresis to respond to thyroid never had a subnormal temperature. Williams believes that a persistent subnormal temperature is a reliable sign of thyroid insufficiency. This condition is to be suspected when in the course of a febrile disease like measles or scarlet fever the temperature falls markedly short of the usual elevation.

The children in the present observation gained weight quite rapidly under thyroid. Williams's explanation for this as a sign of thyroid insufficiency is that without sufficient thyroid secretion to fix calcium salts, bone formation is defective, and the child fails to grow. The close observation of the weight of a child taking thyroid is an indication for continuing or discontinuing the drug. A persistent loss of weight shows an excess of thyroid in the system and is an indication for stopping the drug.

Gothic palate, regarded by most observers as a sign of adenoids and caused by their obstruction, was observed in all the cases of enuresis, while but half had adenoids, and the other half had unobstructed respiration. Williams believes that this is also due to thyroid insufficiency and lack of fixation of the calcium salts. Likewise, the very frequent caries, also observed in this series of children, is attributed to this cause. "The eyebrow sign" is mentioned. This consists of a rarefaction of the outer third of the eyebrow, believed by Léopold Lévi and H. de Rothschild to be a sign of thyroid insufficiency.

Williams has met with very few signs of intolerance in administering thyroid to children, among the most frequent being catarrh of the nasal passages and tachycardia. A rise in temperature to normal is a sign for caution in administration, and a rise beyond normal a sign for suspension of the drug.

R. S. HAYNES.

MOORHEAD, T. GILMAN: A NOTE ON GROCCO'S PARAVERTEBRAL TRIANGLE. (*The Dublin Journal of Medical Science,* June, 1909, p. 417.)

Grocco's sign consists of a triangular area of dullness present on the healthy side, its base lying horizontally about the level of the twelfth rib, and with its apex at the level of the upper margin of the fluid on the diseased side. The sides of this triangle are formed by the vertical line of the vertebral spines internally, and externally by an oblique line joining the apex and the outer extremity of the base. The base itself, as described by Grocco, varies in length from 3 to 10 cm., the exact length apparently independent of the size of the effusion. It is probably due to a mediastinal displacement by the fluid toward the healthy side.

The sign is found only in cases of pleural effusion, and is absent in pneumonia and pulmonary fibrosis. It is not present in all cases of pleural effusion. When present it is of great value; its absence is of less importance. If the sign has once been observed to be present its disappearance is of great value in distinguishing between thickened pleura and persistent effusion.

The dullness never extends above the fourth dorsal spine, even when the effusion fills the entire chest. M. C. PEASE, JR.

ADDISON, B.A., M.D., W. L. T.: THE LATE GLASGOW, EDINBURGH AND BELFAST EPIDEMIC OF CEREBROSPINAL MENINGITIS. (*The Canadian Journal of Medicine and Surgery,* September, 1909, p. 141.)

Dr. Addison's report upon the epidemic of cerebrospinal meningitis in Glasgow, Edinburgh and Belfast is peculiarly interesting because of the use of Flexner and Jobling's serum. That these were true epidemics is shown by the fact that there were 1,005 deaths in Glasgow between May, 1907, and November, 1908; 167 deaths in Edinburgh between October, 1907, and September, 1908; and 725 cases with 548 deaths in Belfast between January, 1907, and June, 1908. In all these cities the epidemic was apparently at its height during the summer months of 1907.

Dr. A. G. Robb, of Belfast, treated 69 cases with hypodermic injections of Colli Wasserman's, Ruppel's, Burroughs and Wellcome's antimeningitis serum, with a death rate of 74 per cent. He then commenced the intrameningeal injection, Flexner's and Jobling's serum, and in 94 unselected cases had 25 deaths, or a mortality of 29.7 per cent.

The article is summed up by Dr. Addison as follows:—

"(1) The most dangerous source of infection is found on the line of transmigration of European immigrants.

"(2) That when the disease becomes established in a city it is most prevalent in small, overcrowded rooms.

"(3) The disease is of low infectivity.

"(4) That the infective organism enters the body probably by two routes: (*a*) the nasopharyngeal area, and (*b*) food and swallowed secretions taken into the gastrointestinal areas. The actual infection by either of these two sources has not been fully demonstrated.

"(5) The infection is a general systemic one and does not invade by a continuity of tissue.

"(6) That the blood has a powerful bactericidal action on the germ of disease and the organism is possessed of a marked autolytic action.

"(7) That the cerebrospinal fluid has little or no bactericidal action, and because of the absence of blood serum the cerebrospinal membranes and cavities are the vulnerable areas of attack.

"(8) That human blood serum injected into the meningeal sac greatly retards the progress of the disease and greatly lessens the mortality of the malady. The statistics, however, are yet meagre, and such treatment must be regarded as one to be used only in the absence of the Flexner-Jobling serum.

"(9) The Flexner-Jobling serum injected hypodermically does not affect the course of the disease, but injected into the meningeal sac it has a specific action in greatly modifying the course of the disease and very greatly lessening the death rate.

"(10) That the agglutination test after six days of illness is a valuable and reliable one."

M. C. PEASE, JR.

FINKELSTEIN, H.: INFANT MORTALITY IN SUMMER. (*Deutsch. Med. Woch.*, August 12, 1909, p. 173.)

Finkelstein attempts to analyze the causes of the high death rate of infants in summer, in an article which contains some points of view not met with commonly in the German literature. He summarizes his article as follows: The high mortality is due in part to heat stroke, the infants dying acutely with symptoms resembling cholera. In the main it is due to the increase of subacute nutritional disturbances, which begin in the warm season, but which prove fatal after the warm weather has passed. The bacterial contamination of the milk by no means can be held solely responsible for the marked death rate of bottle-fed infants. It is probable that in the summer, under the influence of the high temperature, artificially fed babies have less resistance than those who are nursed, and that they may develop intestinal disturbances in spite of being fed on pure and uncontaminated milk. Furthermore, we must remember that the sickly and weak bottle-fed baby is far more susceptible to the injurious influence of heat than is the infant nourished at the breast.

ALFRED F. HESS.

VAS, BERNHARD: LORDOTIC ALBUMINURIA. (*Deutsch. Med. Woch.*, August 26, 1909, p. 1,472.)

In this article the author gives his clinical investigations, carried out after the methods introduced by Jehle, upon a certain number of children who were lordotic and of others who were normal in this respect. He found that what has been generally termed orthostatic or orthotic albuminuria occurs with equal frequency in those with as well as those without spinal lordosis, and that lordosis may be present without causing albuminuria. However, he believes the lordotic posture, by means of decreasing the flow of blood to the kidneys, to be quite capable of giving rise to the presence of albumen in the urine. The credit of pointing out the mechanical influences in the production of this type of albuminuria belongs to Jehle, but it must not be understood that this factor is the sole etiologic moment in the production of this renal disturbance. ALFRED F. HESS.

HYGIENE.

GOODCHILD, J. FLEMING: MILK EPIDEMICS. (*Canadian Journal of Medicine and Surgery*, September, 1909, p. 148.)

Dr. Goodchild closes his article by quoting from Dr. Powers, of London, as follows:—

(1) Outbreak sudden and cessation also abrupt, if allowance is made for the late cases, which have probably become infected from the earlier cases and not by the milk.

(2) A large proportion of the attacks are simultaneous; the outbreak also reaches its maximum too rapidly to admit the possibility of infection from a first case.

(3) Two or more persons in the same house are taken ill at the same time. This may occur apart from milk infection, but it is very exceptional as regards the first invasion of the household.

(4) A very large proportion of the households attacked will be found to have a common milk supply, which, however, may not be distributed by the same retailer.

(5) If the households are classified according to the amount of milk consumed daily, it will be found that the attacks are more numerous among those consuming a larger supply. The wealthier consumers suffer more than the poor.

(6) Attacks are rare among persons who drink little milk or only take it in tea or coffee or always have it boiled.

(7) In scarlet fever milk epidemics the type of the disease is usually mild and attended with low mortality.

(8) Infected cream or milk kept over night has been found to cause more virulent cases of the disease than milk consumed in the fresh state. M. C. PEASE, JR.

PHYSIOLOGY.

KRAMSZTYK, DR. STEFAN: ON THE PRESENCE OF TRYPSIN IN THE STOMACH OF INFANTS. (*Przeglad Pedyatryczny,* Vol. I., Fasc. 3, 1908-09, p. 209.)

Boldyrew (from Pawlow's laboratory) reported, in 1904, that in a series of experiments on dogs he could, under certain conditions, prove the presence of pancreatic and intestinal juice as well as of bile in the stomach. Boas, Crlenoff and Contejeau found in the gastric juice all the ferments of intestinal juice. Pawlow established the fact that introduction of fats in the stomach induces secretion of pancreatic juice and the reversed flow of pancreatic juice into the stomach. Consequently it was proved that under certain conditions the gastric digestion can take all the characteristic features of the pancreatic and enteric digestion. Volhard was the first to apply these facts clinically. In order to induce the flow of pancreatic juice into the stomach he used a test breakfast, consisting of 200 c.c. of olive oil, and after one-half hour he examined the gastric contents. In 86 per cent. of all his cases he found trypsin in the gastric contents. For determination of trypsin he availed himself of the fact that this ferment can dissolve casein in an alkaline medium. Faubel and Lohlein confirm these researches. S. Kramsztyk (in Heubner's clinic) made a series of experiments in the same direction on infants. It is known that trypsin appears in the pancreas of the fetus as trypsinogen, which becomes active under the influence of enterokinase; the latter can be extracted from the mucous membrane of the intestines of a newborn child. As a test breakfast (Oelfrühstuck) Kramsztyk used 100 c.c. of tea, and one-half hour later two teaspoonfuls cod liver oil, and after a half hour the gastric contents were examined for trypsin by the same method, modified by Dr. Fuld.

In a series of 16 examinations the author found trypsin present only in 3 cases of healthy infants; even in these cases trypsin was present in very small amounts. These facts are in conformity with the latest researches of Ibrihim, who could not find any traces of trypsin in an infant of twelve months after a diet very rich in fat (40-50 c.c. olive oil). The author thinks that the scantiness of pancreatic secretion in infants as compared with adults is one of the reasons why fatty food is the most harmful and least digestible ingredient in the infant's diet.

G. R. PISEK.

BOOK REVIEWS.

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and Other Matters Connected with the Work of House Surgeons and Surgical Dressers. Fifth Edition, revised and largely rewritten by W. H. Clayton-Greene, B.A., M.B., B.C., F.R.C.S., Surgeon-in-charge of Out-Patients, St. Mary's Hospital; Lecturer on Anatomy in the Medical School. With 343 Illustrations. New York: E. B. Treat & Co., 1909.

This can hardly be called a small book, although it is issued in a compact form. It contains 592 pages printed clearly on excellent paper and is full of good illustrations. The fifth edition of this well-known book, issued first in 1884, it has been carefully revised and enlarged, and, with the collaboration of a number of men, brought up to present-day practices. It is a book which occupies a peculiar field among the text-books on surgery in that it treats with the procedures and the tools of the trade and not with theory nor symptoms. It abounds with the little things which are not given in larger works and which can be gained usually only by years of practical experience. It is amazing how much information can be put into so modest a volume, whose scope embraces everything from the checking of hemorrhage to the taking of X-ray pictures.

The Production and Handling of Clean Milk, Including Practical Milk Inspection. By Kenelm Winslow, M.D., M.D.V., B.A.S.; and Essentials of Milk Bacteriology. By H. W. Hill, M.D. Pp. 367. New York: William R. Jenkins Company, 1909.

This book presents in a practical manner the application of hygiene and bacteriology to the dairy industry in more attractive form perhaps than any other work. Several chapters on bacteria and their relation to milk, written by Dr. Hill, and one by Dr. Cohn, furnish sufficient directions for the practice of dairy bacteriology, although they cannot supplant the necessity for a course in bacteriology in a well-equipped laboratory. The chapter on the production of clean milk is particularly well written and touches on many matters of importance that are not generally known. This is illustrated by cuts showing various sorts of apparatus for use in the dairy and stable. Milk inspection as practiced by both Milk Commissions and Boards of Health is thoroughly discussed, as well as the practical subjects of the best cows for producing milk, the feeding for milk, and the distribution of milk. The chapter on plans for barns and milk houses unfortunately occupies itself only with two plants near Seattle. This would probably be more useful were plans introduced of other model farms. The milking machine is discussed and is looked upon with rather more favor than is the case with most milk producers who have used it. The use of cement construction for stables and the latest type of bottling machines are not mentioned. This book, however, will make an excellent handbook for all farmers who are trying to improve their milk supply and who wish to learn the reason why they are advised to make certain changes. It gives a simple exposition of the relation of bacteria to milk and makes plain the dangers of dirty milk. It is a book that should also be in the hands of all physicians who have any interest in dairy hygiene. It is gotten up in attractive form, printed with large, clear type, and is well illustrated.

ARTHROSTEOPEDIC SURGERY. By STEWART L. MCCURDY, A.M., M.D., Orthopedic Surgeon to Columbus and Presbyterian Hospitals; Professor of Anatomy and Oral Surgery, Pittsburgh Dental College (University of Pittsburgh), Pittsburgh, Pa. Published by the Medical Abstract Publishing Company, Pittsburgh, Pa., 1909.

This is No. 13 in the list of "Medical Abstracts" published by this firm and deals with the surgery of the extremities and the skeleton.

BACTERIOLOGY FOR NURSES. By ISABEL MCISAAC, Author of "Primary Nursing Technique," "Hygiene for Nurses," "Hygiene for the Use of Public Schools." Pp. 176. New York: The Macmillan Company, 1909.

If it be granted that in order for a nurse to coöperate to the fullest in the prevention of disease, she must have an intimate knowledge of the different forms of bacteria and their cultural characteristics and to have laboratory exercises, including the making of media and preparation of specimens for examination, then this book will undoubtedly serve to impart that knowledge, for it is carefully compiled, accurate on the whole, and as a piece of bookmaking admirable. However, the author goes into the quite unnecessary technicalities of immunity, in language none too clear for a less difficult subject; and whereas she gives a scant paragraph to the always useful discussion of the wonderful benefits of vaccination, she leads her pupil nurses through a page and a half of the opsonic index. It is to be questioned, indeed, whether women of the education of the best of pupil nurses can appreciate all this or need it to be able to keep even surgically clean and to prevent infection.

PRIMER OF SANITATION, BEING A SIMPLE WORK ON DISEASE GERMS AND HOW TO FIGHT THEM. By JOHN W. RITCHIE, Professor of Biology, College of William and Mary, Virginia. Illustrated by Karl Hassman. Pp. 200. Yonkers-on-Hudson, New York: World Book Company, 1909.

This remarkable little book is intended for sixth grade children. It may be read with great benefit by the older brothers and sisters and the parents of such children. Even the most up-to-date physician will find it interesting.

In a wholly admirable fashion Professor Ritchie tells of the relation of the body to germ life, describes and discusses the different germ diseases, bacterial and protozoan, shows how water and food supplies contribute to the sum of these affections, points out unsanitary habits and customs, and indicates the procedures necessary for good public health and sanitation. The chapter on vaccination alone is worth much more than the price of the book.

The illustrations really illustrate, the make-up is attractive, the style lucid and entertaining. It should accomplish a great deal of good.

CENT CONSULTATIONS MEDICALES POUR LES MALADIES DES ENFANTS. Par JULES COMBY, Médecin de l'hôpital des Enfants-Malades, Paris, France. Pp. iv.-190. Paris: Masson et Cie., 1910.

FORMULAIRE DE POCHE POUR LES MALADIES DES ENFANTS. Par le DR. JULES COMBY, Médecin de l'hôpital des Enfants-Malades. Third edition, entirely revised and conforming to the New Codex. Pp. 636. Paris: Vigot Freres, 1910.

The first of these little volumes by Dr. Comby consists of an alphabetically arranged list of 100 of the commoner diseases of infancy and childhood, with brief details of the latest accepted treatment. It is, of course, intended to be a pocket reminder for the practicing physician and not in any sense for the pediatrician.

It will be of undoubted service to Dr. Comby's confreres or to anyone who reads French and wishes such a convenient adviser.

The latter work is somewhat more pretentious. In the first half, the treatment of diseases is given in detail, and in the second, drugs and treatment are discussed under individual headings. There is here a vast amount of information in small compass. In spite of its excellence, this will not have a large field among other than Frenchmen, for the drugs are those of the French Pharmacopeia. Dr. Comby seems to make use of many more drugs in treating children than do the majority of American pediatrists.

THE DISEASES OF CHILDREN. By HENRY ENOS TULEY, M.D., Professor of Obstetrics, University of Louisville, Medical Department; Visiting Physician Masonic Widows' and Orphans' Home, etc. Illustrated. Pp. 653. Baltimore: Southern Medical Publishing Company, 1909.

This is a very acceptable book. It is obviously written for the general practitioner, for the standpoint throughout is that of what he needs and what he will encounter. On the side of pathology and etiology, therefore, there is less emphasis than upon symptoms and treatment. The Southern point of view is also apparent in the inclusion of pellagra and the detail in which malaria is treated. This latter is written by Dr. William Britt Burns, and is very carefully prepared. In the very important chapter on Infant Feeding, Dr. Tuley goes into the production of milk very thoroughly, and separates clearly the mechanical modification of milk from the using of it, but he does not devote enough space to the indications for changes in the various components to meet different emergencies. He does give, in his appendix, many formulæ from Chapin and Kerley which will help the physician to follow good standards, but will not tell him how to know just where the feeding he is giving is wrong and what he should do to make it right, which is the secret of successful feeding. The sections on anterior poliomyelitis and meningococcus meningitis take note of the later researches. There are some excellent schedules for Length of Quarantine, for Care of Babies in Hot Weather, and frequently in the text are introduced helpful tables or tests. The illustrations are good. There are, of course, errors of typography, and one chapter has a wrong heading, but these will no doubt be corrected in the next printing. Dr. Tuley is to be congratulated upon writing a very practical book.

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